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FOOD INDUSTRIES

PRODUCTION · ENGINEERING · DISTRIBUTION

LAURENCE V. BURTON, *Editor*
M. A. WILLIAMSON, *Publishing Director*

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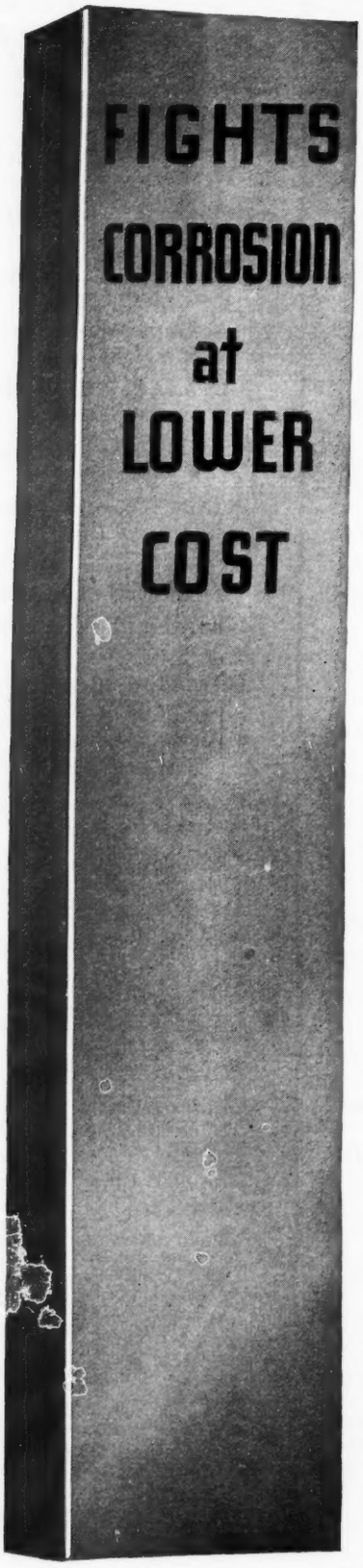

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FOOD INDUSTRIES

Volume 5 Established 1928—McGraw-Hill Publishing Company, Inc. Number 8

PRODUCTION • ENGINEERING • DISTRIBUTION

NEW YORK, AUGUST, 1933

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Laurence V. Burton, Editor

Keep the Main Purpose in Sight

• You may not be convinced of the soundness of the A.A.A. or the N.I.R.A., yet these are the law of the land. Our country is experimenting with a new method of business control and with a new method of getting out of a business depression.

• As an experiment it can succeed or fail. No one can yet be certain of the outcome. But if it is to succeed it must be done in a definite way.

• The whole concept is based on the necessity of having buying power equal to producing power. Anyone with only a rudimentary knowledge of business and economics can reason that far. And anyone can easily understand the converse: that if producing power outruns buying power we will be right back where we were.

• Therefore the experiment is set up on the idea that wages must go up before prices go up. If the experiment is to succeed it must succeed in that way. It cannot succeed in any other way, for this is the way the whole scheme has been planned.

• Manufacturers with whom we have talked are all for the idea of codes and agreements until they come to the place where it is necessary to boost wages now instead of at some later date after prices have gone up. At this point many of them are genuinely concerned. They want to know where the money is coming from. Others who are more fortunate in having sufficient cash on hand are not concerned.

• Opinion seems to divide at the point whether the funds are available or not available. One cannot blame the manufacturer who is hard up for gagging on this pill. Our investigations lead us to conclude that very few would demur in any way if they all had plenty of money.

• It boils down to the question of getting enough money to carry on for a few weeks at a higher wage level until everybody is getting higher wages. The Blanket Agreement and publicity drive will put so much pressure on all to sign up that the backsliders will be sorely tried. In the words of General Johnson, "You had better get going."

• The thing to do right now is to lay plans for financing the wage increases for the next twelve to fifteen weeks, and cooperate in the experiment. Nothing will be so costly as failure. The times call for all the resourcefulness, courage and ingenuity that American business can command.

AS IT LOOKS TO US

What is Needed in a Code

The real effect of the Blanket Agreement drive initiated by President Roosevelt will be to hasten the filing of industry codes.

His proposal for wages and hours for all industry and business is now available. Presumably every food manufacturer and merchandiser will cooperate in the President's endeavor. The signs all point that way.

Divisions of the food business which are satisfied with the Blanket Agreement have no other code responsibility. If they are dissatisfied, then they should put in their codes. All divisions still have the opportunity to correct present undesirable trade practices if they want to. Otherwise the Blanket Agreement stands.

To take advantage of the opportunity they should draft agreements or codes—it is immaterial which name is used—and submit them to A.A.A.

Industry must take the responsibility for initiating this action. A.A.A. will not do so and will not even indicate the scope desired. It is entirely up to each part of the industry to determine what it wants.

Any proposals for a code must presuppose either unanimous acceptance of the President's Blanket Agreement or else adequate provisions for hours and wages of labor in conformity with N.R.A. code ideas.

The Blanket Agreement proposal is a spur to quicker action.

Quality . . .

A recent court decision illustrates the importance of eternal vigilance in protecting the quality of your products. Damage suits totaling $60,000 had been instituted against a well-known candy manufacturer by an alleged consumer of its products. The complaint was that a small piece of wire in candy produced by the defendant had lodged in the throat of the complainant and had caused an infection.

Evidence of carefully controlled and supervised manufacturing operations not only saved the payment of these damages but, what is more important, prevented an undermining of the prestige and good will of the manufacturer.

Watch the quality of your raw materials and your process operations. It pays.

Changes While Frozen . . .

One more factor for consideration in the storage of frozen foods has been unearthed by Joslyn and Sherril at California. Sucrose in some frozen fruits slowly changes to invert sugar on long storage. Fortunately for the fruit freezer, this change can hardly be considered to be a deterioration of quality, such as would be the case were it oxidation or dehydration. But it is testimony to the fact that preservation by freezing is far from being a simple, clean-cut method.

Vacations—English . . .

Manufacturers who are struggling with the demands of General Johnson for reemployment may be interested in the following proposal coming from England. The chairman of Boot's, Ltd., recently recommended a compulsory month's holiday, with pay, for all employees in the retail trade. Instead of shortening the work week this manufacturer proposes to shorten the work year.

Hire One Who Knows . . .

Inquiries still pour in upon us from those who want to make a new product about which they know next to nothing. To be able to make a product is one thing; to be able to sell it at a profit is quite different. Our suggestion to such inquirers is to hire a competent man.

Of course, he will cost money! If you cannot afford him, better lay off and save your money.

Profiteering? . . .

Usually it pays to know all the facts before making public criticism, or even private criticism for that matter.

Those who listened to Secretary Wallace on the radio on July 17 heard him slide out from under the Iowa bread price rumpus as gracefully as a trained diplomat.

While he did not tacitly admit he had lacked full information, he did give the listening world an assurance that Iowa bakers had not indulged in profiteering, that the price rises were justifiable under the then existing conditions.

On behalf of the Secretary be it said, however, that Section 9 of the law compels him to make public the effect of the processing tax upon prices to consumers. (The law should be carefully read.) Apparently he missed finding out about the loaf sizes first.

Caking Prevention . . .

Apparently, the mechanism of caking of salt and sugar involves two steps. With the absorption of appreciable quantities of water by either of them, there is soon a film of salt or sugar solution on the surface of individual crystals. So long as this excess moisture is present, caking does not take place. But when water is evaporated from what is then probably a saturated solution of the material, there is a cementing of adjacent crystals, and caking results.

According to this concept, a finely ground caking inhibitor thoroughly disseminated through the powdered food tends to hold the particles apart and prevent this bonding or cementing.

New Products . . .

When you make a new product be absolutely certain it is right before putting it on the market. And only then should it be released. If the boss is impatient, be firm and deliberate. Don't be rushed into a foolish move. Better to be a year late with a perfect product than a year too early with a dud.

Letters . . .

When you write to us, please do not fail to include your address. Recently we have received an unusual number of letters without return addresses. Obviously, these cannot be answered, despite our very evident desire to do so.

The PROOF *is in the* DRINKING

. . . Would you intrust the outcome of carefully controlled manufacturing operations to the untrained consuming public? The coffee roaster has to!

By P. W. PUNNETT
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WHILE there is a great deal that the roaster can do directly to increase his customer's satisfaction, his best efforts may be nullified by the carelessness or indifference or ignorance of the individual responsible for preparing the beverage.

The adage that "a satisfied customer is the best advertisement a manufacturer can have" is particularly true in the case of a coffee roaster, who, by the very nature of his product, must risk his business future to the fickleness of mass approval. Yet too often he seems unaware of the surprising relationship of the consumer to his product.

The best coffee that can be prepared can be ruined in the making. We suggest that herein lies the most valuable contribution which coffee advertising can make: *the education of the consumer to greater care and intelligence in coffee making.*

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Perhaps the coffee roaster has been too absorbed in the many details and problems of his business—the selection of the green coffees he needs, the fluctuations of the market, the operation of his plant—to see his business in its proper perspective. Possibly he has never taken the time to sit down and really think about his business.

Too often his attitude has been that of a small boy with a basket of inedible mushrooms, in Dr. Wiley's story. "They aren't for eating," he explained, "they are for the market."

The manufacturer occasionally needs to step out of his factory and business, and assume the character of a consumer so that he may examine critically his own product. When it is difficult for him to do this it will pay him to hire a disinterested critic who can play the part of a captious customer.

If the coffee business is analyzed in this way the basic conclusion is reached that *flavor* is what the roaster is really selling—and what the consumer is really buying—not the dark brown granular substance which we call coffee; not a decorated can, carton or bag, but a minute quantity of a very delicate but powerful organic substance which gives the delicious flavor and aroma to the beverage that is America's favorite drink, to the extent of 2½ billion gallons yearly.

Now, the greater the pleasure and satisfaction Mr. and Mrs. Consumer derive from the flavor of a cup of coffee, the more coffee they will drink. And if the flavor in the beverage came from Mr. A's brand of coffee, his business will prosper. In other words, the more pleasure people derive from

using Mr. A.'s coffee, the more coffee he will sell. And, if Mr. A and Mr. B and all the other coffee roasters keep this hypothesis in mind, and strive to increase their customers' satisfaction, it is quite probable that they will increase the per capita rate of coffee consumption appreciably.

The coffee manufacturer's problem therefore is to increase his customers' satisfaction with his product. And in order to know what to do about it, he must put himself in his customers' place and see what it is they enjoy. When this is done, he will find that there are several factors that contribute to their pleasure. And for this reason we suggest that education of the consumer to greater care in coffee making will be the most valuable contribution coffee advertising can make.

First, of course, comes flavor quality. This is not a single, definite thing—something on which everyone can agree. One person likes a light "acidy" flavor and another a heavy-bodied flavor. Perhaps the majority of people prefer a fairly full body—sweet and fragrant and free from any trace of bitterness. This lies within the power of the roaster, through selection of the green coffees making up the blend and through care in the roasting. The consumer should have this flavor intact at the peak of its freshness. This can be obtained by the coffee reaching the consumer immediately after roasting and grinding, or packing it under a high vacuum. It is true, the customer may injure the flavor by the use of a pot which contributes a flavor of its own or one which is not scrupulously clean or by overheating the beverage or letting it stand too long. However, the roasters' contribution remains: a well chosen, properly roasted coffee, delivered fresh from the grinder or so packed as to conserve its fresh flavor indefinitely.

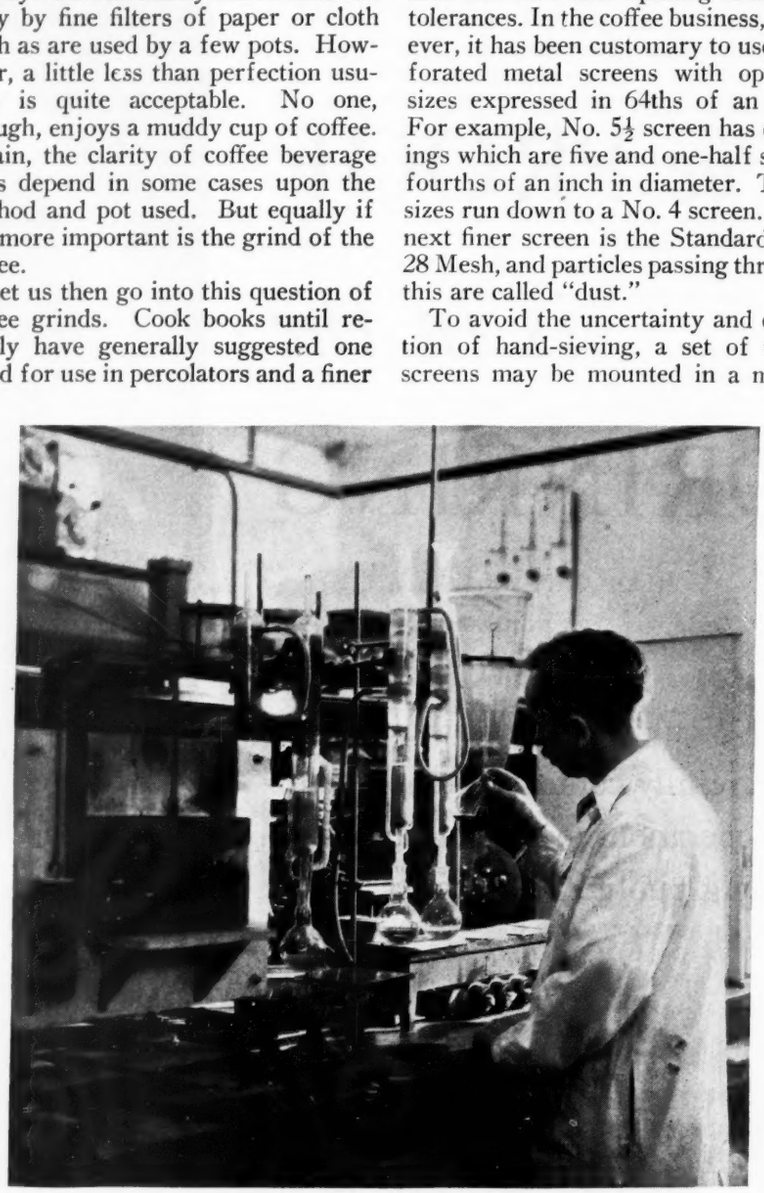
Also, the coffee drinker enjoys good strength in his beverage; perhaps it should be termed "flavor economy." He or she—oftener the latter—prefers to prepare a brew of the desired strength without using extra coffee in the making. Naturally this will depend partly on the method of preparation and the pot used. In respect to methods, the two most popular are the percolation and the drip processes, with the drip method becoming more and more popular. But whatever the method—drip, percolation, steeping or boiling—and whatever the make of pot, economy in the preparation of a brew of the desired strength depends largely on the *grind* of coffee used.

Before we take up the question of coffee grinds further we may note that a third desideratum for good coffee is clarity. Perfect clarity can be obtained only by fine filters of paper or cloth such as are used by a few pots. However, a little less than perfection usually is quite acceptable. No one, though, enjoys a muddy cup of coffee. Again, the clarity of coffee beverage does depend in some cases upon the method and pot used. But equally if not more important is the grind of the coffee.

Let us then go into this question of coffee grinds. Cook books until recently have generally suggested one grind for use in percolators and a finer one for drip pots. And some roasters have marketed their product in the form of the ordinary "steel-cut" and "drip" grind. In other brands, where only the "steel-cut" is available, the purchaser is dependent upon the grocer to regrind it for use in a drip pot. Furthermore, a casual inspection of samples of different brands—all supposed to be "steel-cut"—will readily disclose particle size differences that are easily visible to the eye. These differences suggested the advisability of a nation-wide survey of coffees in respect to the degree of grinding that various roasters use.

In determining particle-size distribution in a ground material it is customary to use sets of sieves with a graduated series of openings. Ordinarily these are expressed in meshes per inch and there are definite standards for wire and opening sizes and tolerances. In the coffee business, however, it has been customary to use perforated metal screens with opening sizes expressed in 64ths of an inch. For example, No. 5½ screen has openings which are five and one-half sixty-fourths of an inch in diameter. These sizes run down to a No. 4 screen. The next finer screen is the Standard No. 28 Mesh, and particles passing through this are called "dust."

To avoid the uncertainty and exertion of hand-sieving, a set of these screens may be mounted in a motor driven shaking device such as the Ro-Tap. While such a set-up gives excellent results and must be used as a reference standard, it is expensive and hardly simple enough for use by those in charge of the grinders in a roasting plant. With this in mind, there has been constructed an inexpensive device which gives results accurate enough for the checking of factory grinders' performance. It consists of a cylindrical No. 4½ screen slightly inclined from the horizontal and capable of being rotated by a hand crank in the first models and by a small motor in a later design. The measured sample of coffee—usually ¼ lb., though a volume measurement can be used—is fed



slowly by a hopper at the upper end into the slowly revolving screen. Beneath the screen are two or more pans, one of which receives the "tailings" falling from the lower end of the screen. These "tailings" are composed of the particles too large to pass through the openings. Through the courtesy of Jabez Burns & Co., manufacturers of coffee-roasting machinery, a large number of siftings of coffee samples, made on their Ro-Tap machine using standard screens, were tabulated (Table I) in order to compare the distribution of large-size particles—on No. 5½—with the combined "on No. 28" and dust.

Further, the sum of percentages retained on the No. 5½, No. 5 and No. 4½ screens can be compared (Table II) with the sum of the "on and through No. 28 screen" with similar results.

The comparisons (Table II) indicate that the percentage of "tailings" obtained from the cylinder screen sifter can be used as a measurement of the degree of grinding, or "fineness."

Through various sources, 52 samples of coffee were obtained. These included both local and national brands —some ground by grocery stores and the rest by the manufacturers. There were samples from Honolulu, Seattle, San Francisco and Los Angeles in the West; Chicago, Detroit, South Bend, Cleveland, Dayton, Milwaukee, Duluth and Minneapolis in the North Central section; New Orleans in the South; and Boston, Springfield, Providence, New York City, Baltimore, Lynchburg and Poughkeepsie in the East. The results of the sifting tests are given in Table III.

Table I—Relation Found to Exist Between Two Means of Testing Fineness of Coffee Grind

Left on No. 5½ Screen Per Cent	On and through No. 28 Screen Per Cent
0— 2	85—50
2— 6	50—40
6—10	40—35
Over 10	Under 35

Table II—Relation Shown by Percentages for Eight Samples Taken at Random

On No. 5½, No. 5 and No. 4½ Screens Per Cent	On and through No. 28 Screen Per Cent
68.4	20.6
52.5	27.9
48.1	27.0
45.2	35.2
27.7	45.4
26.8	47.8
26.1	53.3
14.9	57.5

Table III—Distribution of Percentage of Tailings From Sifting Tests Made on 52 Medium-Grind Coffees

Percentage Groups	Number of Coffees	Percentage Groups	Number of Coffees
0—10	0	40—50	19
10—20	3	50—60	8
20—30	4	60—70	6
30—40	7	70—80	2

Grinds Vary Widely

It will be seen that the largest group is that of the 40-50 per cent range, which contains over 36 per cent of the total. About 28 per cent are finer and the rest coarser. If we are to judge by these results the most commonly accepted grind of coffee is that represented by the 40-50 per cent group. But if this is the correct one for the "steel-cut" type, then the rest certainly are not. However, one may well suspect that the variation observed above is either a matter of chance or else that there is no generally accepted standard grind—no definite information on the subject; merely guesswork or prejudice.

In addition to the above samples, six samples of bean coffee were purchased in New York City from as many stores belonging to one of the large grocery chains. In each case, when the pound of coffee was purchased, the drip grind was requested. The six samples were sifted in the rotary sifter with the following percentages of tailings: 0.0, 15.2, 34.5, 42.2, 61.5, and 62.2. In other words, what was obtained ranged from a pulverized to a very coarse, barely broken bean coffee. The fault, of course, must have lain between faulty condition of the grinders and carelessness of the store clerk. Probably the above variation must be expected when coffee is ground in most groceries. Few clerks welcome the extra work of grinding every pound of coffee sold.

If the above situation exists, it would seem well worth while to attempt to determine whether there is such a thing as a "universal" grind—one that would be equally suitable for percolators and drip pots—and what advantages it would offer both the roaster and the consumer. Theoretically at least, a "universal" grind would seem to be desirable for the coffee trade. For those who are marketing two grinds at present it would offer a simplification of factory operation and a reduction in the size of warehouse stocks. And in another way it would prevent the occurrence of an undesirable situation that must often arise in the retail store. Let us illustrate.

Mr. A roasts an excellent blend and puts out both a steel-cut and a drip grind. Mr. B, the grocer, hesitates about carrying a full stock of both, and when Mrs. C asks for A's coffee in a drip grind, he tells her he is all out of it but has D's coffee, which is suitable for a drip pot. So Mrs. C takes the "D" coffee, and the next time doesn't ask for "A"s coffee. Mr. A has lost a customer.

For the producer who is turning out only one—the steel-cut—a universal grind would settle a moot question and make his product equally available for both the percolation and drip methods —the latter being on the way to becoming the more popular of the two. The only disadvantage from the production point of view probably would be some reduction in the rate of grinder output if, as might be expected, the universal grind should prove to be finer than the majority of those given in Table III. If this were to be the case, we suspect that it would act as a spur to the improvement of present-day grinders.

From the standpoint of the consumer, a universal grind would be acceptable in the first place because it would eliminate the necessity of having the coffee reground for use in the drip pot. Such a grind, however, would have to offer advantages in respect to strength economy in the preparation of the brew and, furthermore, should permit satisfactory clarity.

Fine Grind Best

We have direct evidence to offer as to the value to the consumer of a grind which would be classified in the 10-20 per cent tailings class in respect to flavor economy. A study was made in behalf of one of the producers of a well-known national blend comparing the grind he had been selling with a finer one of the same coffee. Most pots have a capacity of six to ten cups, but are seldom used to capacity. Now if a drip pot is designed to make eight cups of coffee in 10 minutes, and if only three or four are made, the dripping time may become so short that full extraction of flavor is not attained if the coffee is coarsely ground. Likewise, if a percolator is used and the time is kept constant to get full extraction, the beverage will be overheated and the flavor injured. Hence it is felt that, if a finer grind is satisfactory as to beverage clarity, the increased speed of extraction will give greater beverage strength in the case of the drip pots and better flavor, at least, in the percolators, due to the shorter extraction time possible.

The two grinds—the coarser giving 47.7 per cent of tailings and the finer 18.1 per cent—were used in three pots:

(Turn to page 336)

Economical Clarification Through Use of Enzymes

BY J. J. WILLAMAN
Röhm & Hass Co., Inc.
Philadelphia, Pa.

How to lick the problem of getting rid of troublesome colloids in fruit juices

FOODS must look well to sell well, of course. Fruit juices are no exception. Turbid or cloudy apple cider does not appeal like a clear, brilliant product, even though the flavor be the same. A brick red grape juice will not sell as readily as a purplish black one. A murky jelly is handicapped beside a sparkling jelly.

Fruit juices when first expressed naturally contain finely suspended matter. Some of this settles out on standing; much of it can be removed by simple filtration or centrifuging; but the colloidal material which causes the real cloudiness can be removed only with considerable difficulty and cost by filtration. Usually a plate and frame filter press, with a silicious filter aid, is used, but the cake clogs quickly and the filtrate is not always sparkling. Pulp filters give about the same result. Other filters containing a fabricated pad or disk give good results, but they require a prefiltration and are somewhat expensive to use. Caldwell,[1] tried milk, egg white and Spanish clay to coagulate the colloids in apple juice, but with only moderate success, and these materials are not used commercially so far as we know. Gelatine, either alone or in combination with tannin, is commonly used for coagulating cider, and a very clear product results. Its shortcoming is that the resultant sludge must be allowed to settle, as it is too slimy for ready filtration, and must either be discarded or turned into vinegar stock. The coagulum also adsorbs considerable color and some flavor from the cider. Furthermore, the quantities of gelatine and tannin must be nicely balanced for proper action.[2] A flash heating method for coagulating the colloids of apple juice before filtration has also been suggested.[2]

We see, then, that although the problem of producing a sparkling fruit juice is one of filtration, the problem behind this is the preparation of the juice for economical filtration. Coagulation of the colloids by heat and by mechanical adsorbents has been tried. Why not destroy the colloids chemically?

The main material in colloidal form in fruit juices is pectin. There is some protein and a little tannin, and sometimes starch, if the juice has been heated; but pectin is the most abundant and the most troublesome in clogging filters. Of the possible known ways of partially or completely decomposing pectins or of converting them into less hydrated or less slimy forms, we have: boiling them for some time with acid; treating with alkali, then with acid or with a calcium salt; hydrolysis by enzymes. The last obviously is the most feasible for a fruit juice.

The enzyme pectinase has been known academically since 1898. It was not until a few years ago, however, that any attempt was made to produce it for practical purposes. It was then found that it could be produced from fungi, and that when the enzyme was added to solutions of pectin or to fruit juices containing pectin, hydrolysis of the pectin occurred, and subsequent filtration was made very much easier.[3] A commercial preparation was made available later.[4] Apparently Mehlitz,[5] in Germany, was working on the same idea simultaneously, but with the special objective of preparing juices for a germproof filter.

It has been found that when pectin is acted upon by pectinase, 95 per cent of it becomes water soluble by the formation largely of galacturonic acid and galactose. About 5 per cent, however, is insoluble, and is of the nature of the lignins. It forms a bulky precipitate which settles readily, occludes other particles in suspension, and is easily filtered. Thus, the net result of the action of pectinase is the conversion of a difficultly filtered liquid into an easily filtered one, and a solution of the problem of fruit juice clarification.

Enzyme Action Requires Time

Enzymes are specific in their action. That is, a different enzyme is involved in the hydrolysis of each kind of substance, such as starch, fat, sucrose, protein, cellulose. In some cases the specificity is even more marked; for example, pectin from various sources seems to respond differently to pectinase obtained from different origins.

Enzymes require time in which to perform their work. In this respect they are not like most well-known chemical reactions, such as the neutralization of an alkali by an acid, where the action takes place as soon as the materials are brought together. On the other hand, enzymes are catalysts. They are not used up in the reaction, but continue their work as long as there is any unchanged substrate left. Within certain limits, the higher the temperature the more rapidly they work. In the case of pectinase this limit is about 120 deg. F.; beyond this it becomes less active, because of the destructive action of the heat.

If twice as much enzyme is used in one case as in another, it will accomplish its work in about half the time. Conversely, the same quantity for twice the time will accomplish about twice as much.

Approximate Amount of Pectinol Required for 100 Gal. of Juice

	Time before ready to filter			
	5 hr.	15hr.	30 hr.	48 hr.
Temperature	Oz.	Oz.	Oz.	Oz.
40 deg. F.	..	30	15	10
60 deg. F.	55	16	9	6
120 deg. F.	16	4	.	..

Enzymes are also favored by a proper degree of acidity or alkalinity. The optimum for pectinase is about pH 3.0. As we may not juggle the pH of fruit juices without changing their flavor, it is fortunate that the pH of Concord grape juice is just about optimum for pectinase, while the pH of 3.7 to 4.0 of cider is only a little off the optimum.

Enzymes are now used in the food industries to clarify fruit juices and cereal beverages, to remove starch from pectin liquors, to convert grain mashes for alcohol production, and to coagulate milk for cheese making. The marked contrast between the appearance of clarified and cloudy grape juice, as shown in this photograph, has been emphasized by the use of a strong light filter over the camera lens.

Thus we see that the rate of enzyme action is affected by at least four factors: time, temperature, pH and quantity of enzyme used. The user of enzymes has some or all of these within his control, depending on the nature of the process.

Enzyme Clarification Methods

The treatment of juices with the enzyme has been fitted into the regular commercial procedures in various ways. In the case of cider, the enzyme is added to the juice as soon as it is pressed. If the temperature in the tank permits (50 to 70 deg. F.), enough enzyme is used to bring about clarification over night. If lower temperatures prevail, it is more economical to allow two or more days. In some cases, where cider is pressed at one place and shipped to another for processing, the enzyme gets in its work during transit, and the juice is ready for filtration when it arrives at the bottling plant. Clarification can be effected in a few hours if the cider is heated to about 100 deg. F., but this is not feasible in most plants for various reasons.

In the case of Concord grape juice, the enzyme is added at one of several stages. When the juice, after sedimentation of the argols, is removed from the carboys for bottling, it is collected in kettles or tanks, warmed to 50 to 70 deg. F., and sufficient enzyme added to bring about clarification over night. The juice may be warmed to 110 deg. and clarification effected in a few hours, but there is some loss in flavor during such warming in open containers. In one case, where the juice is preserved in tanks at 28 deg. F. instead of in carboys, a small quantity of enzyme is added during the filling of the tanks at pressing time, and clarification is complete after a month or two. Due to the destruction of the colloids, the argols crystallize faster under this treatment.

In one experimental lot, the enzyme was added to the grape berries just before heating and pressing. As the heating was moderate—about 125 deg. F.—the enzyme acted very rapidly, and the colloids were destroyed by the time the juice was pressed. The argols had separated within a few weeks, and a simple filtration before bottling yielded a black, rich colored juice. An ordinary filter press, with a good silicious filter aid, suffices very nicely. Pulp or pad filters are not so satisfactory, because usually there is no way of keeping the filtering surface refreshed with a filter aid, and it soon clogs. The Michigan Experiment Station has developed a very simple but effective bag filter for small operations.[6]

Fruit Juices Not Uniform

Like all biological products, fruit juices are variable. They vary in composition and in their response to pectinase. Northern grown Concords are not the same as Southern, and a different enzyme preparation has had to be devised for them. Apples differ from grapes, and require a different enzyme preparation. Fresh pressed cider clarifies much more readily than cider kept in storage. Cider from stored apples, however, responds very readily to the enzyme. We hope some day to have the explanation of these apparent anomalies.

Strawberry juice clarifies easily; cherry juice with considerable difficulty. Currant juice contains considerable pectin, and more precipitate is formed than in other juices, but filtration is easy, and the resultant juice produces a brilliant jelly.

Because of the interdependence of time, temperature and quantity of enzyme, and because of the variations in juice due to locality, season and handling, it is not possible to set up a fixed formula for the enzymic clarification of juice. However, an approximation can be offered, and this is useful as a guide in working out the proper treatment at any one plant. This approximation is based on clarification over night at 60 deg. F., using 1 lb. of the proper enzyme preparation for 100 gal. of juice. The approximations for other conditions are given in the accompanying table.

Clarifying Does Not Sterilize

Enzymic clarification is in no sense a sterilizing operation. It merely destroys the colloids and enables easy, clean, economic filtration to take place. Heat is a common and satisfactory way of sterilizing the filtered

(Turn to page 301)

Why Have Twenty-Three *Formulas When* Four *Are Enough?*

Through the use of standardized ingredients under controlled conditions cream center making becomes a definite operation

By JAMES A. KING
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HAVE you ever taken the time to look back through your old formula book to see how many methods you have for making essentially the same product?

A few weeks ago I was checking over a 20-year accumulation of cream center formulas and found 23 for fondants. There were "water-killed" fondants; fondants "doctored" with acetic acid, vinegar, and cream of tartar; and fondants in which starch, fruit juices and pulp, jap jelly, gum arabic, dextrine, gelatine, honey, corn syrup, and invert sugar were used.

If a chemist were to summarize them, he would find that the essential constituents are sugar, invert sugar, corn syrup and water. He would also tell us that this fondant or cream center is composed of thousands of tiny sugar crystals, each of which is surrounded by a film of syrup. That the number of these crystals in relation to the syrup portion has a direct bearing on the texture of the cream center and on its ability to resist fermentation; whether it be a cast, a hand- or machine-rolled, a short plastic, a flowing, a liquid, or a cordial fruit cream. Also that the "water-killing," the "doctoring" and the adding of honey, corn syrup and invert sugar are for the purpose of keeping the centers soft for a longer time and yet holding to the minimum losses due to "leaking" or "bursting."

There was a time when cream-center making was referred to as an art. Now, thanks to the work of Owen, Booker, Schneller and Paine, we can proceed with assurance to build a cream center that will retain its freshness, will not ferment, and will uniformly have the consistency specified on the work sheet. These qualities have been placed under control largely through the elimination of "water kills" and "doctor" and by the development and use of standardized ingredient materials which can be weighed off in definite quantities and heated to definite temperature ranges to obtain definite results.

Under the newer methods of candy making, as well as under the old, the key to the candy maker's success lay in having the proper quantity of invert sugar in his finished product to give the correct ratio of syrup to the number of sugar crystals present.

Under the newer procedure, the candy maker has an additional advantage in that by the use of these standardized ingredients he can develop a few basic formulas by means of which he can produce on short notice a large variety of candies. Colors, flavors and similar secondary ingredients can be added in the final processing to give the desired variety.

The following direct application of principles will illustrate the points I am making.

Let us assume that you are about to take on a new foreman for the cream department and that I land the job. Shortly after my arrival at your plant you will introduce me to the sales manager. He will proceed to tell me the troubles he had with the previous foreman: the cream centers weren't uniform; the flavors and colors varied; when he wanted a short plastic center, he got a hard one; half of the whipped creams were hollow on the bottom; flowing cream centers were almost as elastic as nougat; the hand-rolled creams were more like putty; worst of all, when he sent up a rush order it would take three or four days for the creams to reach the shipping room. Added to all of this, too often he would get back a batch of cream centers that had fermented.

Then Mr. Sales Manager will grin and say, "Jim, it's not an easy job, but go to it and do your best, and, by the way, take this list with you and rush the work as fast as you can."

Here's the list: mint cast cream centers, short, heavy type; vanilla cast cream centers, moderately soft, but not flowing; orange cream center shorter and lighter; raspberry cast cream centers, rather soft to flowing; coffee, imitation, hand-rolled cream centers cast into starch, plastic and light; lemon extra light whipped cast cream centers; chocolate pudding cast cream, flavored with cocoa powder, short; chocolate pudding, cast cream, flavored with bitter chocolate, plastic; and crystallized creams, assorted flavors.

The list includes a total of ten distinct types of cast cream centers. And, I am confronted with the question of how many kinds of fondant must I use to make the ten different centers.

I believe that up-to-date candy makers will agree that only one basic fondant is necessary, and that I shall also need three other stock preparations, namely: a frappé No. 1, a

Condensed from paper read before the production forum of the National Confectioners' Association Convention in Chicago on June 20, 1933.

Chart I—Formulas for Ten Types of Cast Cream Centers

Using One Basic Fondant and Three Basic Frappés

Flavors of Cast Cream Centers	Consistency Cream Centers	Basic Fondant	Sugar	Corn Syrup	Water	Chocolate Unsweetened	Cocoa Powder	Open Kettle Molasses	Boiled to Deg. F.	Frappé No. 1	Frappé No. 2	Frappé No. 3	Refined Invertase	Colors and Flavors	Casting Temperature
			PREPARE THE "BOB" BY BOILING THE SUGAR, CORN SYRUP AND WATER, THEN MIX WITH THE FONDANT												
		Lb.	Lb.	Lb.						Lb.	Lb.	Lb.	Oz.		Deg.F.
Mint	Short Heavy Type	100	45	5	Sufficient to dissolve sugar	--	--	--	236	8	--	--	1½	Mint	140-145
Vanilla	Moderately Soft - Not Flowing	100	35	15	"	--	--	--	234	15	--	--	2	Vanilla	140
Orange	Shorter and Lighter	100	35	15	"	--	--	--	236	--	15	--	2	Orange	145
Raspberry	Rather Soft to Flowing	100	40	10	"	--	--	--	232	10	--	--	3	Raspberry	145
Coffee	Imitation Hand Rolled, Plastic - Light	100	30	20	"	--	--	--	236	--	20	--	3	Coffee	140-145
Lemon	Whipped - Cast Creams - Extra Light	100	Melt Fondant to 145 deg.F. (No Bob)		--	--	--	--	Not Boiled	--	--	30	1	Lemon	135-140
Chocolate Pudding	Plastic and Light	100	35	15	"	6	--	--	236	--	--	35	1	Chocolate	140
Cocoa Powder Pudding	Short and Light	100	35	15	"	--	10	--	238	--	--	35	1	Cocoa Powder	145
Molasses Mint	Plastic - Moderately Light	100	25	--	"	--	--	25	236	15	--	--	2	Mint	140
Assorted Flavors	Short Crystallized Creams	100	70	10	"	--	--	--	244	--	--	--	--	As desired	165-175

BASIC FONDANT

80 lb. Sugar
20 " Corn syrup
10 " Standardized Invert sugar
Water to dissolve the sugar

Boil to 238-244 deg. F. then cool to 110 deg. F. and cream.

FRAPPÉ - NO. 1

50 lb. Corn syrup
50 " Standardized Invert sugar
1 " Albumen - dissolved in
2 " Water

Boil the corn syrup to 245 deg. F. Shut off the steam, add the standardized invert sugar and stir until melted. Promptly place the batch into a beater, start the beater, then gradually add the dissolved albumen and beat until light.

FRAPPÉ - NO. 2

50 lb. Corn syrup
50 " Standardized Invert sugar
2 " Albumen - dissolved in
4 " Water

Boil the corn syrup to 245 deg. F. Shut off the steam, add the standardized invert sugar and stir until melted. Promptly place the batch into a beater, start the beater, then gradually add the dissolved albumen and beat until light.

FRAPPÉ - NO. 3

50 lb. Corn syrup
50 " Standardized Invert sugar
1½ " Gelatine - soaked in
3 " Water
1½ " Albumen - dissolved in
3 " Water

Boil the corn syrup to 245 deg. F. Shut off the steam, add the standardized invert sugar and stir until melted. Promptly place the batch into a beater, start the beater and add the soaked gelatine and beat until dissolved, then add the albumen solution and beat until light.

frappé No. 2 and a frappé No. 3.

I shall first make the basic fondant, using the following proportions: 80 lb. sugar, 20 lb. corn syrup, 10 lb. standardized invert sugar and sufficient water to dissolve the sugar. The size of the batch will depend upon the capacity of the equipment, as this formula can be handled successfully with any type of equipment, and it may be made in 100-lb. or 1,000-lb. batches. The temperatures to which the batch will be boiled will vary between 238 and 244 deg. F.

While the fondant is being made, I shall get busy and make up the three batches of frappé. The frappé No. 1 will be made by boiling 50 lb. of corn syrup to 245 deg. F., to which 50 lb. of standardized invert sugar will be added and stirred until it has melted. Then the batch will be placed promptly in a beater, the beater started, 1 lb. of albumen dissolved in 2 lb. of water will be added gradually, and the batch beaten until light.

The formula for the frappé No. 2 is practically the same as the frappé No. 1, with the exception that twice as much albumen is added in the beater. The frappé No. 3 is to be used especially for whipped creams and chocolate pudding, and this will be made by boiling 50 lb. of corn syrup to 245 deg. F., to which 50 lb. of standardized invert sugar will be added, and mixed well. This syrup will be transferred immediately to a marshmallow beater, the beater set in motion, and, after the batch is beaten for a minute or two, 1½ lb. of albumen and 1½ lb. of gelatine each dissolved in 3 lb. of water are added, and the batch is beaten until it is almost cold.

I think it is good practice to make the frappé in advance, so that it is practically cold by the time it is used. This insures better air retention. The purpose of the frappé is to lighten and whiten the cream centers. It also has a definite influence on the final texture of the cast cream centers.

Now, let us suppose I have about 100 lb. each of the frappés made and about a ton of the basic fondant. We know that there are three distinct steps or stages to the manufacture of cast cream centers: the manufacture of the fondant, the preparation of the frappé, and the setting up or boiling of the "bob," or "bobtail," or, as our British friends term it, "the conserve syrup."

By varying the percentage of sugar, corn syrup and water used in setting up the "bob." I can largely determine and control the final temperature of the cast cream center batch at the time it is ready to cast into starch. I favor the use of about 50 lb. of the "bob" syrup to 100 lb. of the basic fondant, and think it is good practice to have the fondant warm (about 120 deg. F.) at the time the "bob" is poured and mixed into the fondant. This, as a rule, will result in a casting temperature ranging between 135 and 150 deg. F., depending, of course, upon the temperature and quantity of frappé used.

If you will refer to Chart I, you will find that an attempt to produce changes in the texture of the cream centers is made by using different quantities of corn syrup and sugar in the "bob" and also by the addition of larger or smaller quantities of the frappés No. 1, 2 and 3.

A Practical Example

Let me explain this further. Take the formula entitled "Mint Cast Cream Centers, Short, Heavy Type." I place 100 lb. of the fondant in a melting kettle and warm it to about 120 deg. F. Then I proceed to set up the "bob." It consists of 45 lb. of sugar, 5 lb. of corn syrup and about 15 lb. of water which are boiled together to approximately 236 deg. F.; promptly removed from the kettle; and poured into and mixed with the fondant. Now I add only 8 lb. of the frappē No. 1. If I wanted to make this center tougher or less short, I would cut down on the sugar and increase the quantity of corn syrup. Furthermore, if I wanted to make a lighter center, I would increase the frappē.

Now I have the three parts of the cream center batch all mixed together, and at this point I add 1½ oz. of refined invertase. After the invertase is thoroughly worked through the batch, the color and flavor are added, and if I check on the temperature of the batch at this point I shall find it will be in the neighborhood of 140 to 145 deg. F.

Without the addition of invertase the quantity of water present in the syrup portion of centers made with this formula (mint cast cream centers) would be about 25 or 26 per cent, making about 75 or 74 per cent of solids in the syrup portion. From experience I know that cream centers containing syrup of such low density will ferment and that cream centers of higher density—say, 24 to 21 per cent water—are less likely to ferment, and, on the other hand, that cream centers having a syrup of 80 per cent solids, meaning 20 per cent of moisture, are practically certain not to ferment. As the quantity of water present in the syrup portion of the fondant determines whether the centers will or will not ferment, it is a matter of safety first to add the invertase. Through the action of invertase a sufficient quantity of the sugar present will be inverted to increase the density of the syrup to a point where danger from fermentation will be practically eliminated.

With the invertase, color and flavor properly worked into each batch and the temperature of the batch at from 140-145 deg. F., I am ready to cast. From this point on my procedure will be the same as if I had started with an individual formula for each of the centers specified by Mr. Sales Manager.

But as I started with but four basic formulas, I have been able to use the full production capacity of the equipment and have cut in half the time formerly required to get out such a variety of candies. What is equally important is the fact that my batches are produced under factory production conditions and I can duplicate them in large quantities whenever called upon to do so. Also if a greater variety had been requested, I could have produced them from those same basic formulas.

Correction

In the text on pages 249 and 250 of the July, 1933, issue of FOOD INDUSTRIES, Fig. 2 should read Fig. 1 and Figs. 3 and 4 should be Figs. 2 and 3.

The different starch conditioning systems may be identified by clipping out the following captions and pasting them under the indicated illustrations on pages 249 and 250.

Fig. 1—In the directly heated and cooled system of A. Huhn Manufacturing Co., the starch is conditioned after passing through a cleaner between runs through the mogul.

Fig. 2—A current of tempered air drawn through the Wolf Co. type of indirectly heated system dries the starch while it is being cleaned.

Fig. 3—Heated air passing through the revolving drum of the Hersey Manufacturing Co. type of indirectly heated system dries the starch before it is cleaned. In a separate drum the starch may be cooled before being used.

Born of the Depression

How an experienced production man started a new enterprise on a shoestring

By M. J. WALSH
Kelp Laboratories
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AFTER I parted company with my job in February, 1932, I took an inventory of my assets to determine what I could do to make a living. They consisted of a big block of stock in another company, on which at that time I could not realize anything; a few insurance policies, on which I might be able to borrow six or seven hundred dollars; a good working knowledge of the kelp industry; and a conviction that I could develop a small-scale market at least for quality kelp products.

I borrowed $700 and set out on the smallest possible scale of operation. The necessary requirements for my proposed undertaking were a means to harvest the kelp and equipment for dehydrating, grinding, screening and packing.

A small bed of kelp was leased from the California State Fish and Game Commission, a small fishing boat was rented, and harvesting begun. The plant was located in an old cannery on the San Diego waterfront, and an obsolete fish smokehouse was converted into a six-compartment dryer, adapted for festoon drying and for shelf drying with a multiplicity of trays. With no other expenditure than a little second-hand lumber, some chicken wire and piping for the natural gas required for heating, and with the assistance of two experienced workmen a dryer was contrived which was adaptable for dehydration not only of kelp but of land vegetables as well. The total cash outlay for this installation did not exceed $50.

Selection of a source of power to get the necessary 25 hp. without too great a capital expenditure offered a problem which was solved by the use of a Cadillac chassis. The initial cost was $20, with an additional $9 for a pulley drive to the transmission, and by venting the exhaust into the side wall, 25 hp. was available without any standing charge. The gasoline consumption was 10 gal. for 8 hours, whereas fixed charges for an electric motor with accessories would have been $25 per month.

Much thought was needed also in the selection of grinding equipment, as the second-hand grinders offered at bargain prices seemed beyond the limits of the budgetary provisions. Finally, a small mill from one of the nationally known mail-order houses was found to meet the requirements, and a little unit, complete with screens and a very efficient cyclone, was obtained for $75. Trips to wrecking yards and junk dealers provided an adequate assortment of line and jack shafts, pulleys and belting, together with a mechanical screen, at an additional outlay of $25. With some labor these accessories were assembled into a self-contained and compact little manufacturing unit.

The first manufacturing efforts resulted in the production of 100 lb. of pure dehydrated kelp which was marketed as tablets, under the trade name Keltabs, in bottles of 200, through local drug stores on prescription. While the proprietary product expanded, an outlet for dehydrated kelp in bulk and for dehydrated land vegetables gradually developed, so that within a period of six months the operation, in addition to the original treatment of kelp, also included dehydration of celery, spinach, parsley, parsnips, onions, garlic and other vegetables.

As to the merits of the dehydrated kelp, a product intended primarily to serve as a nutritional supplement for human use, the fundamental justification for the existence of this industry lies in that our soils are deficient in a surprising number of minerals which have been lost through the process of erosion and inadequate fertilization. Foods grown on such soils lack these minerals and other ingredients that have been leached out. Recent developments in the science of nutrition are bringing to light the importance of a great variety of minerals in correcting so-called deficiency diseases, and the inadequacy of our normal diets in providing these essential minerals is becoming more and more appreciated. Marine vegetation, as kelp, on the other hand, is found to be correspondingly rich in the minerals in which our land foods are most deficient. To use kelp as a nutritional supplement to our diet of land-grown foods, therefore, is a logical step.

Retain Flavor and Color

A study of kelp reveals that marine vegetation has a delicate organic structure. Its high and varied mineral content is present in both organic and colloidal combination, and this combination should be retained as closely as possible in the dehydrated product. We therefore aimed at removing the water without injury to the organic structure; the fact that the original pigmentation, flavor and pronounced fragrance of the growing plants were retained indicates that this was successfully achieved. The same restriction holds for land vegetables. If these cannot be dehydrated without loss of the original pigment and characteristic flavor, the work should not be attempted.

During the first year's operation the plant was placed on a paying basis, the capacity was gradually increased, the original working capital was not only kept intact but augmented out of earnings and a small inventory of finished products has been built up.

ENZYMES *Can Cause Off-Flavors Even When Foods Are Frozen*

But by their inactivation before freezing, this damage can be prevented

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ONE phase of vegetable canning which has been given relatively little attention is the inactivation of enzymes, the organic ferments which may cause quality deterioration in the product. The survival of enzymes after the scalding of vegetables, later to be processed at high temperatures, is merely of academic interest, since the enzymes are completely destroyed at the processing temperatures.[1]

However, the survival of enzymes after the scalding of vegetables to be preserved by freezing may be of great importance.[2, 3] Low temperatures and ice formation do not inhibit enzymatic activity, though low temperatures do retard it. A number of investigators have studied the biochemical changes resulting from organic ferments in horticultural products.[4, 5, 6, 7, 8, 9] The performance of these experiments at temperatures higher than those commonly used in freezing preservation does not vitiate the applicability of the results to that method; the differences are in degree rather than in kind. Practically speaking, the important changes in frozen vegetables are those involving chemical composition, texture, color, flavor and odor. The aim of the preliminary experiments reported here is to show the relation of certain visible changes in peas during the scalding to persistence of enzymatic activity, as indicated by the action of catalase in the pea tissue on hydrogen peroxide. For some varieties of peas, at least, the destruction of catalase seems to parallel the death of other enzymes, perhaps more directly involved in quality deterioration.

Palladin[10] was among the first to demonstrate that the enzymatic activity of frozen organic matter is not necessarily destroyed by freezing. British investigators[11] recently reported that freezing and storage at low temperatures with a minimum of —313.6 deg. F. did not have a permanent inhibiting effect on autolytic enzymes. Observations in the Frozen Pack Laboratory at Seattle have borne out these findings.

Unscalded peas stored at freezing temperatures may develop undesirable odors, which become particularly noticeable when the peas are cooked. The intensity of the odor may vary roughly with the period of preliminary scalding, when that is inadequate, but it is absent when the peas have been thoroughly scalded.

Four to six weeks usually was required for an undesirable odor to become distinctly noticeable in commercially stored peas. Thereafter, the intensity of the odor seemed to increase for a time, and, finally, to be reflected in the flavor. This finding indicates that, although the unscalded or improperly scalded peas seem to be in a satisfactory condition at the time of freezing, the enzymatic activity eventually seems to produce a cumulative effect.

There may also be a marked deterioration in color during freezing storage. After storage at —5 deg. F., scalded Alderman peas were found to retain their original color, but at 20 and 25 deg. F. there was a color deterioration even in scalded peas, and at 25 deg. F. evidences of bacterial spoilage were observed. The bright emerald green color of scalded frozen-pack peas is an important factor in the marketing of the product and its retention is highly desirable.

By appropriate methods, the extent of heat penetration during scalding in selected Alderman peas, as determined visually, was compared with the catalase activity in such peas, qualitatively demonstrated with hydrogen peroxide. An index of heat penetration was calculated, it being the ratio of twice the width of the darker green penetration area characteristic of heated pea tissue, determined by measuring across the inner face of the cotyledon, to the entire diameter of the cotyledon. The peas selected were of the sizes commonly included in the medium and large canned peas. The presence and intensity of the catalase reaction, or its absence, is noted with the conventional plus and minus signs.

Table I—Relation of catalase activity to index of heat penetration in Alderman peas

(Scalded in water for different periods of time at 212 deg. F., 190 deg. F., and 160 deg. F. and stored at 20 deg. F. for four months).

Scalding Period	Temp. 212 deg. F.		Temp. 190 deg. F.		Temp. 160 deg. F.	
	Catalase Reaction	Index of Penetration	Catalase Reaction	Index of Penetration	Catalase Reaction	Index of Penetration
Sec.						
10	+++	0.13	++++	0.15	.....	....
20	++	0.54	+++	0.28	.....	....
25	+	0.60	.....	.....	.....	....
30	—	0.92	++	0.38	.....	....
40	—	1.00	+	0.84	.....	....
50	—	1.00	—	1.00	.....	....
60	.....	....	—	1.00	+++	0.12
75	.....	....	.....	....	+	0.34
90	.....	....	.....	....	+	0.36
105	.....	....	.....	....	—	0.86

In larger peas +; in smaller peas —.

A study of Table I reveals a relationship between catalase activity and heat penetration, as indicated by a color change in the flesh of the pea. It would seem that individual peas must show a color change affecting, roughly, at least 90 per cent of the

cotyledon diameter before there is reasonable assurance of catalase destruction and, by inference, general inhibition of enzymatic activity.

The practical lesson to be learned from this is that mere reference to the exterior color of the peas during scalding is not adequate, because even when insufficiently scalded, peas may show a dark green surface color at packing time. Only a careful examination of the peas will give assurance that the enzymes have been sufficiently inactivated.

When heat processing follows preliminary scalding, the rapidity of cooling in the scalded material may not have much significance. However, the continued heating of insufficiently cooled scalded peas intended for freezing preservation may result in definite undesirable changes in color and texture. Hence, rapid cooling of the scalded peas to ordinary water temperature is essential.

Two changes were noticeable in the condition of unscalded peas stored to 20 deg. F. for a little more than four months: the characteristic color of frozen unscalded peas after storage and the unmistakable odor above mentioned. A storage temperature of 20 deg. F. was chosen for the test in order to hasten the development of undesirable characteristics in the product during storage. Experience with other lots of frozen peas, held at —5 and 15 deg. F., indicated similar results over much longer periods. In peas scalded at 212 deg. F. up to 30 seconds there was a progressive decrease, during storage, in color changes and in the presence of undesirable odors. When the peas were scalded for 30 seconds or longer at 212 deg. F. the color was entirely satisfactory and no unsavory odor was detected in either the heated or uncooked samples. The same was true for peas scalded at 190 deg F. for 50 seconds and at 160 deg. F. for 105 seconds.

Variation in the size of peas, when field run stock is packed, may markedly affect the satisfactory scalding of the whole batch, because the degree of heat penetration is influenced by the size factor. Therefore, the grading of peas intended for frozen pack in two or three sizes is suggested.

In conclusion, by reporting these brief experiments with peas, emphasis is placed on the importance of adequate scalding and rapid cooling immediately thereafter of vegetables to be preserved by freezing. The preliminary experiments indicate the persistence of enzymatic activity in unscalded frozen peas, when these are thawed after storage for several months at 20 deg. F. Experiments with other frozen vegetables packed without scalding and stored at —5, 15 and 20 deg. F. indicate that this is also true, in a greater or lesser degree, for asparagus, lima beans, corn, spinach and beans.

The suitability of every kind of container for frozen foods, as well as proper processing conditions, are tested in the Frozen Pack Laboratory at Seattle.

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Economical Clarification Through Use of Enzymes

(*Concluded from page 295*)

juice. Chemicals are not satisfactory, because when used within legal allowances, they do not preserve the juice indefinitely. Reclouded cider has been found in all cases to be due to the growth of microorganisms.[7]

The Seitz germproof filter sterilizes juices without any heat effect, and gives high quality beverages.[2] It is difficult under industrial conditions, however, to maintain sterility in the containers which are to receive the sterile filtrate.

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CURLED or FLAT . . . SMOOTH or BLISTERED

Putting consumer satisfaction into flaked cereals is a job for the food engineer

By R. SUNDERMAN
Pittsburgh, Pa.

IN the preparation of cereals, the flaking or rolling of the cereal has become as essential to its market acceptance as the choice of the cereal itself. This factor plays such an important part that manufacturers are stressing the manner in which the flake shall be formed to meet with consumer approval.

Some of the points under scrutiny are: Is the appearance of the flakes pleasing? Do they have appetite-appeal when served? Do they retain their identity as flakes or do they "mush" up? These queries apply to cereals to be cooked before serving as well as to the ready-to-serve type such as corn, wheat, and rice flakes.

Oatmeal flakes, rolled flat, make a mushy porridge not relished by all. On the other hand, an oatmeal flake rolled with a curl will retain its identity when served and is more appetizing. The same comment applies to ready-to-serve cereals. If the flakes collapse upon the addition of milk or cream, they lose their crispness and are "soggy" and unappetizing to eat. If they retain their crispness they will require chewing.

From the manufacturer's point of view a flat flake packs close and calls for a smaller display package, whereas a curled or blistered flake requires a larger package which usually is more appealing to the purchaser.

Flaked Oatmeal

Oatmeal probably was the first rolled cereal. The old style Scotch or cut oatmeal required a long soaking and cooking period. Introduction of the flake reduced or practically eliminated the soaking and the oatmeal cooked in much less time. This improvement made oatmeal more popular and adds but little to the cost. The steamer, rolls and aspirator replace the cutter and grader.

In the usual method of flaking, the groats are conveyed to a steamer and from the steamer to a small tempering hopper, where they remain for a short time. This absorption of moisture (tempering) prevents excessive "flouring," which is wasteful, as the flour usually goes into feed to sell at a price lower than the flakes.

From the tempering hopper the groats are fed over a screen to the rolls by a shaker feed equipped with control gates which regulate the quantity going to the rolls. From the rolls the flakes pass over another screen and through an aspirator to remove all flour, excessive moisture, and any loose hulls which may adhere to the milled oats.

The finished flakes then pass to the bin over the packing machine where a suction fan draws air through them to remove the remaining moisture. Removal of this moisture is important, because, if allowed to condense in the corners of the bin and become mixed with oat flour, it promotes mold growth and webbiness.

Various types of steamers are used. A steam jacketed conveyor, having the upper side of the inner conveyor pipe perforated, permits steam to come in direct contact with the groats as they pass through the conveyor. Also the steam in the jacket surrounding this conveyor warms the groats to give better rolling. Another popular type consists of a vertical perforated pipe which carries the steam inside an outer jacket. The groats pass between the steam pipe and the outer jacket. Usually the outside jacket is in the form of an inverted cone having a wide bottom which will hold a considerable quantity of steamed groats for tempering before they pass to the rolls.

The rolls usually are 12 in. in diameter, are not cooled, and run about 250 r.p.m. To produce an attractive curled flake there should be a slight differential in the speed of the rolls, although even-speed rolls are much used.

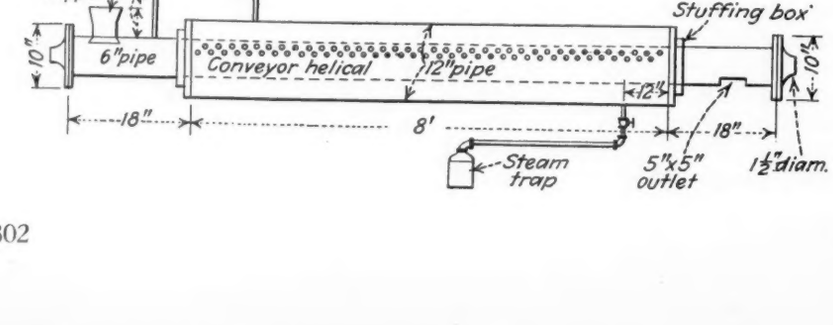
Flaked Wheat, Corn and Rice

Flaking of wheat which is to be cooked before serving should be done in exactly the same manner as the rolling of oats, except that the screens should be larger to permit the wheat berry and flake to pass through.

In the flaking of corn for ready-to-serve cereals, cooked and dried corn grits are tempered about 24 hours, conveyed to the hopper over the rolls, and then fed to the rolls by corrugated feeders. As they pass through the rolls they usually are carried on a belt conveyor to the toaster. If the flakes are to be blistered, they pass directly to the hot toaster where the moisture in the flakes is quickly converted into steam and produces the blisters. If no blisters are wanted, the flakes pass from

(Turn to page 336)

Tempering rice or corn in this steaming conveyor will produce greater uniformity of flake at the rolls than merely transporting them by ordinary conveyors.



KNOWING . . . *Not Guessing* What They Really Want

By H. S. KNOWLTON

Boston, Mass.

FOR years candy manufacturers have offered assortments of chocolates to consumers with but a limited knowledge of the kinds and flavors which are most acceptable to the public in particular geographical areas. This knowledge has consisted chiefly of: (*a*) the volume of sales of individual chocolates in bulk; (*b*) the reception given a specific assortment in a package.

Realizing the inadequateness of this meager information, the New England Confectionery Co., in the spring of 1932, undertook an extensive survey of the northeastern section of the country to find out prevailing preferences in flavor, size, center and coating as a foundation for a box assortment designed to meet the requirements of the so-called "fancy package" and "quality bulk chocolate" market. The consumer of this type of candy is sold through first-class retail dealers. The survey was based on the establishment of a consumers' research group, or jury, embracing several thousand persons located in New England and ranging in age from 18 years upward. Sample boxes were mailed to each individual in the group; opinions and comment were solicited on inclosed card forms with prepaid postage back to the factory; and the analysis of the replies over a 3-months' period established the brand known as "Chateau Chocolates," retailing at a base price of $1 per pound in ½-lb. 1-lb. and 2-lb. boxes, and containing twelve varieties per box.

The consumers' research group was confined to New England because of the individualities of regional taste in candy. The names of the members were obtained mainly through the cooperation of local newspaper publishers and included five male classifications: executives, professional men, students, salesmen and sales clerks, and office workers. There were four feminine classes: professional women, students, housewives, and office workers. Letters were mailed to each person on the list inviting cooperation without expense to the recipient. Twenty-seven per cent of the individuals invited to participate in the tests replied favorably and were enrolled.

The letters sent them stated that the replies received by the company would be held confidential, and explained what the company was seeking to achieve, the reasons for the tests, results expected and proposed establishment of a line based on taste analyses.

Upon receiving a favorable reply the Chateau Chocolate Sales Co. (a New England Confectionery subsidiary) sent to each consumer in the group a sufficient number of test packages in sequence to exhaust the possibilities of ingredient combinations in the offered assortments.

Each test box contained four varieties of three to four pieces per variety. The varieties were designated as A, B, C and D on the return card inclosed in each box, reproduced herewith. A typical sample box inclosed 4 oz., each variety being identified by letter and name, such as A, Chateau vanilla creams; B, cashew nuts; C, Brazil nut caramels; and D, almond butter crunch. Identification was by printed cards placed immediately above the corresponding varieties in the boxes. Reports of jury members were simplified to the limit by the use of checks on the card squares. Variations in taste and judgment with respect to the submitted samples were indicated in one section. In a second place a most important report was made as to the items the group member in question would look for in a candy assortment, and finally, space was reserved for comments. Ninety-seven per cent of the test boxes mailed to group members brought back report cards. Replies were keyed by numbers and analyzed by ages, occupations, cities and country groups. Age classifications were 18 to 30; 30 to 50, and above 50, for both men and women. Cities were analyzed in classes of over 100,000 population, between 10,000 and 100,000, and under 10,000.

Returns from a sample mailing of test boxes gave the following percentage opinions out of a possible 100 per cent rating: Varieties A and C, 90.9 per cent; varieties B and D, 69.4 per cent and 67.7 per cent respectively. The standing of preferences reported in answer to Question 2 on the return card was: C, 69 per cent; A, 60 per cent; B and D, 27 per cent each. This showed that the group enjoyed varieties A and C equally in the test assortment in hand, but that in examining an assortment item C was preferred above the rest.

The comments were of much value. In some cases they pointed the way toward an improvement in manufacturing methods. In others they revealed improved methods of packaging. Thus, in the standard built-up units resulting from the survey, the name of each piece boxed is printed in silvered lettering on the fluting of the container cup. This increases the pleasure of the consumer, as it enables him or her to select pieces individually preferred under all conditions where a choice is offered. Besides the regular variety of chocolates usually offered the consumer, the company included several newly designed pieces in the test boxes, and these have been

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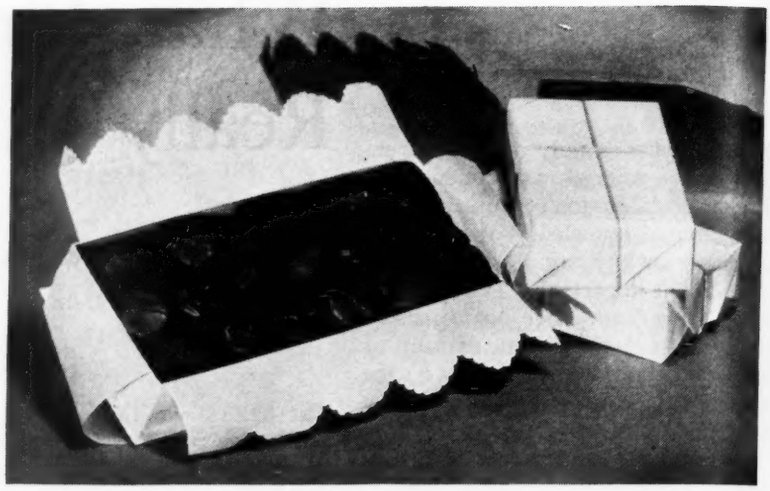
As Beta Lactose Milk Sugar Becomes A Food



MANY LOVERS OF GOOD CANDY find chocolate-covered creams "too sweet." This objection is now being overcome by the use of as much as 40 per cent pure lactose in the fondant. Further developments may increase the lactose percentage without detracting from the appetite appeal of good candy.

Drying at higher temperatures increases the solubility and the sweetening power of milk sugar without changing its nutritional value.

BY FREDERICK M. GREENLEAF
Department of Dairy Husbandry
State College of Washington
Pullman, Wash.

IN a manufacturing sense the principal difference between ordinary milk sugar and beta lactose is the temperature at which the sugar is produced. As a food product the difference is far more significant. Ordinary milk sugar, known as alpha hydrate lactose, lacks sweetness; has a rather unpleasant, flat, chalky taste; and leaves a prolonged sandy sensation in the mouth, due to its insolubility. For these reasons its use has been limited largely to the field of pharmacy and medicine, with some use by bacteriologists, and in the manufacture of confectionery and medicinal liquors.

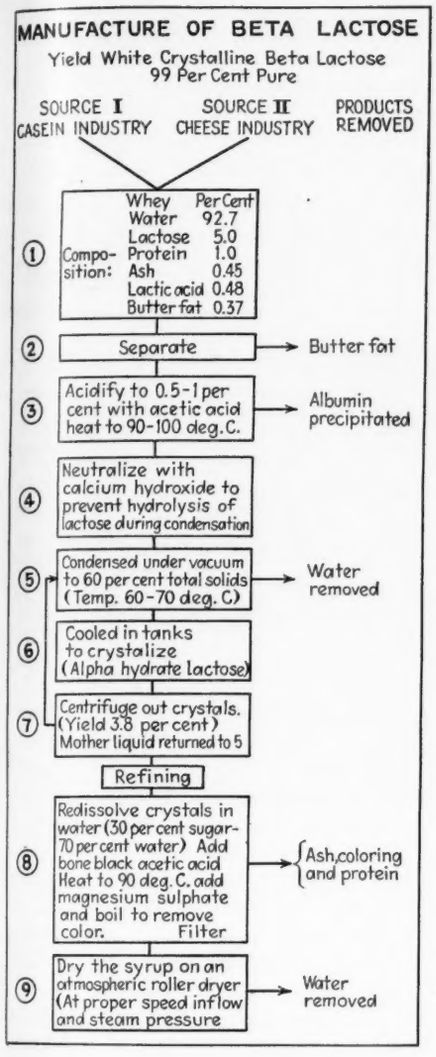
Beta lactose, on the other hand, is much sweeter (about one-fourth as sweet as sucrose), is pleasant to the palate and, when pulverized, will dissolve even more rapidly in cold solutions than will sucrose. It may be used on cereals, on fruits and in cold or hot drinks.

Roll-dried beta lactose is crystalline, non-hydroscopic and stable under normal conditions. However, under some rather abnormal experimental conditions[4] it has been found that the presence of from 0.5 to 1.0 per cent moisture may cause a reversion of beta to the alpha form. But under normal market conditions, no water is absorbed and no significant changes occur after 30 days' exposure to an atmosphere of 90 per cent humidity. Reversion proceeds rapidly in the presence of alkalis, which indicates that equilibrium would be established rapidly in foods of an alkaline nature. Reversion is rapid also at 75 deg. C. in the presence of water. As both forms of lactose are of equal value to the body and as, regardless of which form is eaten, the typical equilibrium is established before the intestines are reached, these reversions have no effect upon metabolism.

The number of brands of beta lactose on the market at present are few. In fact only one is definitely labeled as such. They vary considerably in appearance. Some are granular in contrast to others of a light powdery form. Some are white; others have a cream color, depending upon the degree of refinement. Crystal fineness probably is the cause for the variation in the apparent sweetness of these products. Solubilities of all brands are almost identical.

Dietetic and nutritional researches on the therapeutic value of lactose show that it is closely linked with the bacteriology of the intestines. The human intestine normally contains, along with other desirable and beneficial organisms, two acid-producing bacteria; *Lactobacillus acidophilus* and *Lactobacillus bifidus*. The latter, favored by the relatively high lactose content—7 per cent—in mother's milk, predominates in the infant's intestines. As the diet is changed to cow's milk—lactose content 4.3-4.8 per cent—the *acidophilus* type replaces the *bifidus* type and dominates the acid flora.

These acid bacteria, when present in sufficient numbers, hinder the growth and toxin production of undesirable types, mostly proteolytic, of intestinal flora. According to Bergheim[1], the *acidophilus* organism can use only lactose and dextrin as food. As dextrin is bitter and unpleasant to the palate, lactose becomes the only suitable human food for the prophylaxis of intestinal disorders. Bergheim also states that it is the only sugar that will facilitate calcium and phosphorus assimilation. Because lactose has a relatively slow rate of


MANUFACTURE OF BETA LACTOSE
Yield White Crystalline Beta Lactose
99 Per Cent Pure
SOURCE I
CASEIN INDUSTRY
SOURCE II
CHEESE INDUSTRY
PRODUCTS
REMOVED
Whey
Per Cent
Water 92.7
Lactose 5.0
Protein 1.0
Ash 0.45
Lactic acid 0.48
Butter fat 0.37
Composition:
1
2
Separate
Butter fat
3
Acidify to 0.5-1 per cent with acetic acid heat to 90-100 deg. C.
Albumin precipitated
4
Neutralize with calcium hydroxide to prevent hydrolysis of lactose during condensation
5
Condensed under vacuum to 60 per cent total solids (Temp. 60-70 deg. C)
Water removed
6
Cooled in tanks to crystalize (Alpha hydrate Lactose)
7
Centrifuge out crystals. (Yield 3.8 per cent) Mother liquid returned to 5
Refining
8
Redissolve crystals in water (30 per cent sugar-70 per cent water) Add bone black acetic acid Heat to 90 deg. C. add magnesium sulphate and boil to remove color. Filter
Ash, coloring and protein
9
Dry the syrup on an atmospheric roller dryer (At proper speed inflow and steam pressure
Water removed

absorption in the intestine there is little tendency for it to be stored as glycogen. Infants, as well as adults, are unable to convert it into body fat. However, it does favor growth and weight increase by accelerating the growth of muscle tissue.

Lactose is best defined as a true animal sugar and it occurs as a principal constituent in the milk of all mammals. In fact, its occurrence appears to be limited to milk, as, up to the present time, it has not been extracted from any other source in nature. Also the biosynthesis of lactose has been definitely shown to take place exclusively within the mammary gland.

In its alpha hydrate form milk sugar was first made, commercially, early in the eighteenth century and its production became established as an industry in Switzerland. About fifty years ago the industry shifted to the United States, where the production of cow's milk was rapidly increasing and a cheese industry was developing. Since then its production in this country has progressed until now the United States leads the world in its production. Even so, when compared with the production of raw cane sugar in continental United States, the production is not so great.

When one considers also the quantity of available milk sugar lost annually through cheese whey and casein industry wastes, this yearly production does not appear very significant. To understand this low production and consumption of lactose, its physical properties must be taken into account.

For this reason investigators have experimented much to develop a form of milk sugar having more suitable properties. The result is a commercial method for producing beta lactose, an anhydride and an isomer of the older form—alpha hydrate lactose. Until recently it has been known only as an expensive chemical curiosity rather than as a food.

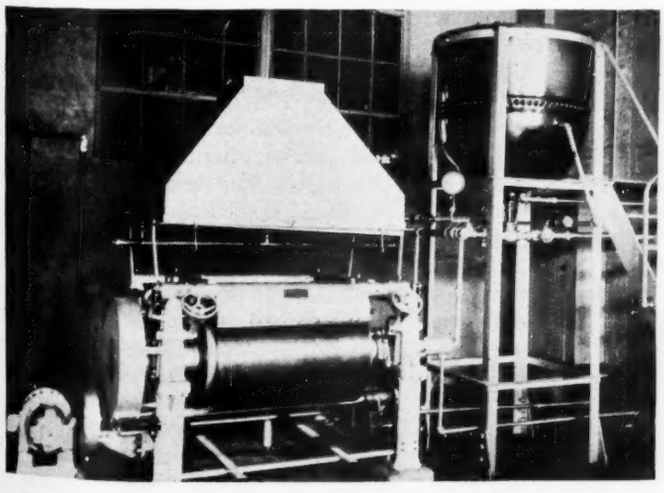
In all milk or milk products in which lactose is in solution the two forms are in an equilibrium in which there are 1.55 parts of the beta to every part of the alpha hydrate form. The mixture has an optical rotation of 55 deg. and the equilibrium ratio is not affected by concentration. When lactose is removed from solution through evaporation, the temperature at which the evaporation takes place determines which form will be produced—an important factor in the manufacture of the sugar. Alpha hydrate crystallizes out of solution at temperatures below 93.5 deg. C. (200.3 deg. F.). Above this temperature, beta lactose is formed, indicating that 93.5 deg. C. is both a transition and a dehydration point.

In the process for the commercial preparation of lactose (the old form) from cheese whey, butter-fat impurities are first removed from the whey by centrifugal separation. Albumin is precipitated by acidifying, usually with hydrochloric or acetic acids, and by heating with steam to 90 deg. C. The whey is then neutralized to prevent inversion of the sugar and concentrated under vacuum at about 150 deg. F. until a thick syrup containing 50-60 per cent total solids is obtained. After cooling, with agitation, the lactose crystals are separated by centrifuging. An increased yield of about 0.5 per cent is usually obtained by reworking the mother liquor from the first extraction. Following these operations, the crystals of the crude sugar are redissolved in water (solution to have about 25 per cent total solids), and the impurities precipitated by the addition of bone black, magnesium sulphate and acid, accompanied by heating. Recrystallization produces pure alpha hydrate crystals as a fine white, crystalline powder.

Prepared and identified first by Erdmann in 1855, beta lactose was synthesized later as a chemical by methods too expensive for use outside the laboratory. More recently the intent has been to produce it on a commercial scale as a food, to provide an outlet for wastes of the dairy industry.

The National Milk Sugar Co., using a process worked out by Paul Sharp,[2] of Cornell University, Ithaca, N. Y., but not made public, is able to produce 99 per cent pure beta lactose on a commercial scale for the same market price as the old alpha hydrate lactose.

R. W. Bell,[3] of the Bureau of Dairy Industries, Washington, D. C., in his work, has carried on experiments using both spray and heated-roll methods of dehydrating the solu-



Atmospheric - type rolls heated by 75 lb. steam pressure and run at 5 r.p.m. produce 99 per cent pure beta lactose from a 30 per cent milk sugar solution.

tions. In the spray method, a 20 per cent lactose solution was forewarmed to about 100 deg. C. and dried by the Gray-Jensen spray process. The product was amorphous and much more soluble than the alpha hydrate, but it failed to contain any great percentage of beta form. Its specific rotation of 55 deg. at 20 deg. C. proved that it was a typical equilibrium mixture of this sugar. Also, the crystals were very hygroscopic and unstable.

In his experiments using the heated-roll (drum) method, vacuum and atmospheric rolls were used, heat of the rolls was varied, numerous speeds of the drying rolls were tried and various concentrations of the lactose solution were dried. A 99 per cent pure product—specific rotation of 35.5 deg. (100 per cent beta lactose = 35 deg.)—was obtained by passing a 30 per cent sugar solution over rolls of the atmospheric type, heated at a steam pressure of 75 lb. and run a a speed of 5 r.p.m.

While it has been shown that beta lactose is beneficial as a baby food; that it is not fattening; that its polatability compares favorably with sucrose; that it may be used in a large variety of foods, there still remains the factor that the cost is still almost prohibitive for use in large quantities. However, if used in combination with sucrose or in quantities recommended by the manufacturers (3-4 oz. daily), it should not prove too expensive.

The future of beta lactose seems favorable in that the cost of manufacture should be considerably lower when it is consumed in greater quantities, and that there is known to be an almost inexhaustible supply of cheese whey and skim milk as the source of supply. An increase of lactose consumption should also exert a favorable effect upon the dairy industries since the economical disposal of whey and skim milk has for some time been a real problem.

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What the Plant Man Should Know About MOTORS

By ERNEST W. FAIR
Oklahoma City, Okla.

ELECTRIC motors are built to operate long, give little trouble and require infrequent attention. This they do and do so well that plant men sometimes fail to give them proper care. The result is a motor failure with loss of production and expensive repair or replacement.

Attention must start with the installation. A vital factor is accurate alignment. With geared motors, an error of a few thousandths of an inch in alignment will produce destructive vibration. When gears mesh properly, it is possible to pull a thin piece of paper from beneath the teeth without tearing it.

After the motor has been correctly installed, a systematic inspection, at least once a week, is advisable. Where the air is laden with dust, as in bakeries and flour mills, close attention to cleanliness and unrestricted ventilation is imperative. An easy way to test motor ventilation is to blow smoke toward the rotor and notice how rapidly it is drawn through the machine. To keep a motor clean, periodical removal of the rotor (or armature) is advisable. Some plants use compressed air in cleaning, but there is danger of driving foreign material into the windings and causing a short-circuit. During inspections, bearings should not be removed from the rotor shaft unless necessary, since this tends to impair their fit.

In lubricating a motor, the oil wells must be filled with high-grade dynamo oil. Animal or vegetable oils will dry and gum. The bearing housings should be kept almost half full of a good quality neutral bearing grease, the old grease being removed and replaced yearly. Excessive lubrication is destructive, since the oil runs onto the coils and causes dirt and dust to collect, restricting ventilation and soaking the insulation.

Lubrication, belt tension and shaft alignments are the important factors in bearing life. Hot bearings usually result from oil that is too heavy or too thin, from dirt or grit in the oil, or from belts that are too tight or gears that mesh too closely. Pulley hubs rubbing against the bearings and improper alignment that causes the shoulder on the armature shaft to pull against one bearing also produce heating. Another cause is a sprung armature shaft.

If the armature is at the point of rubbing against the iron of the field, it is a sure indication that the bearings need to be replaced. A heavy rumbling at the time of starting usually means that a bearing is badly worn.

Faulty motor performance quite frequently may be traced to the brushes or commutator. Brushes should move almost freely in their holders, and brush conductors, or "pigtails," must be long enough that they do not pull the brushes out of alignment. In making replacements, the brushes are fitted by placing fine sandpaper around the commutator and revolving the rotor by hand. On motors that have commutating poles, the manufacturer fixes the brush position at the neutral point. This position should be changed only for compounding or parallel operation.

Commutators must be clean and well polished for efficient motor operation. A piece of canvas or non-linting material is best for doing this. Vaseline or oils should not be used on a commutator. To remove roughness, polish the commutator with a piece of sandstone having the same radius as the commutator. Sandpaper pressed against the surface with a curved block of wood also may be employed. Never

use emery cloth on a commutator or brush.

When a motor fails to start upon application of power, look for a dirty cutout contact, an open circuit, open winding or tight bearings. If the motor heats excessively, the trouble may be due to heavy overloads, excessive room temperature, short-circuits or grounds in the windings, obstructed air passages, worn bearings, excessive voltages, sparking at the commutator or excessive brush tension.

A little systematic attention to electric motors not only avoids upsets in the production schedules but insures full value from the capital invested in the machines.

This inexpensive brush washer serves as an auxiliary to a large spray washer during rush periods. With two operators, it doubles the plant's capacity.

INEXPENSIVE BRUSH WASHER

Doubles Plant Capacity

By FRANK K. LAWLER
Food Industries

DURING rush periods, the Jersey City plant of the Atlantic Commission Co. was unable to wash vegetables fast enough to meet the demand. But to install another spray washer, the type already used in the plant, would have involved an investment out of keeping with the quantity of production the machine would have been called upon to handle.

A survey of the equipment available for washing vegetables disclosed a machine that met the requirements. It provided a large increase in capacity—in fact, doubled the capacity of the plant—and yet the cost of installation amounted to only a fraction of that for a spray washing machine.

Installed as an auxiliary, this machine consists of two revolving brushes driven by a ¼-hp. motor. The stalks of celery or other vegetables to be washed are fed into the machine by hand, using one or two operators. To equal the 1,500-doz. bunch daily capacity of the spray washer, two operators feed the machine. With one operator, the capacity is cut in half.

A comparison between the performance of the two machines is interesting.

Both machines do satisfactory cleaning. However, with extremely dirty celery, the Atlantic Commission Co. reports that the brush washer does a more thorough job of cleaning because with it the operator can hold the celery between the brushes until all the dirt has been removed. With the spray washer, operating it at full capacity, the celery is often piled one stalk upon the other so that some of the stalks may not be subjected to vigorous washing action. With the dirtier celery, an inspector usually stands at the delivery end of the machine to pick out any stalks not properly cleaned and wash them by hand. Comparing the two machines from the standpoint of working conditions in the plant, the spray washer ranks above the brush machine, for with the latter much water is splashed upon the floor.

Although the capacity of the brush washer equals that of the spray machine, the cost of washing per unit of production is not the same, for the former requires more labor. With two operators feeding the brush washer, two men are required to carry the trimmed celery to the machine and two workers are needed to take it out of the tank, With the spray machine, the girls doing the trimming stand alongside the machine and place the stalks directly on the conveyor. The machine washes automatically and requires only one worker to remove the cleaned celery. This means that the spray washer requires the labor of five more workers when cleaning the same quantity as the spray machine. This is one of the reasons why Atlantic Commission Co. uses it only as an auxiliary. Of course, power costs with the brush washer are much less. In this particular plant, the spray machine utilizes a 5-hp. motor for driving the spray pump and a ¼-hp. motor on the conveyor. This compares with the ¼-hp. motor on the brush washer.

In installing the brush washer, the plant superintendent mounted it on cross members in a wooden tank 8 ft. long, 3 ft. wide and 3 ft. deep. A second tank of the same size extends in front of the washer and joins the first tank to form a "T." This tank receives the vegetables after they have passed through the brushes. The tank supporting the washer is covered with boards to form a platform on which to place the celery and from which to feed the machine. To prevent the brushes from throwing water, a splash board about 2½ ft. high is set on the edges of the tank paralled to the brushes and about 2½ ft. from the machine.

The water in the tanks is changed once a day. Before draining, a worker removes the leaves floating on top of the water, using a piece of heavy wire screen bent at right angles to form a kind of water rake.

The maintenance on the brush washer under normal operating conditions consists of about two sets of brushes a year. Continuous operation with two feeders increases the maintenance to about three sets.

After operating the brush washer as an auxiliary to the spray machine for several months, the Atlantic Commission Co. finds this set-up quite satisfactory.

REVIVING A LOST ART

Put Idle Milk Drying Plants to Work

EGG DRYING HAS COME BACK TO AMERICA

By ALBERT K. EPSTEIN
The Emulsol Corporation
Chicago, Ill.

THE DRYING of eggs in the United States was a lost art. About thirty years ago a considerable quantity of egg products was dried in this country, but, because of certain economic conditions, the industry was transferred to China. Millions of pounds of dried egg products have been imported annually to this country since that time. As a result of the efforts of certain leaders in the National Poultry Council, the tariff on dried egg products was raised to 27 cents a pound in 1931. This rise in tariff stimulated a number of American manufacturers to invest money in and enter this new American industry.

A few American plants sprang up in various parts of the country, and 1932 marks the beginning of a real American dried-egg industry. At the present time there are a number of plants distributed over various parts of the country, in the egg-producing as well as in the egg-storing centers. Geographically the plants are located in the states of Washington, Texas, Kansas, Missouri and Illinois. In Texas there are three plants: one plant dries whole eggs only; the second plant produces spray-dried yolk and some spray-dried albumen; and the third plant utilizes the egg whites resulting from the spray yolk and changes it into dried crystal albumen. The plant in Chicago dries albumen only and is using the egg whites which result from the preparation of frozen yolks which enter the mayonnaise industry. This plant is doing a great service in that it utilizes a byproduct and reduces the amount of cold-storage holdings of frozen whites.

In the beginning of 1932 there were a number of idle milk-drying plants equipped with spray-drying systems of the Merrel-Soule or the Gray Jenson type. A considerable amount of money was invested in these plants and equipment, but because of the overproduction of milk products these plants were not in operation. It was natural, therefore, that attention should be drawn to these idle plants, and it was suggested that they be utilized for drying egg products. For this reason practically all the dried yolks, whole eggs and a small quantity of the dried egg albumen are produced by the spray process. The accumulated engineering experience used in drying milk was applied with great success to the drying of eggs. All that was necessary was to change the procedure, and the results were satisfactory. In this connection the problems of factory sanitation which are incident to the drying of milk were also applied to the drying of egg products, with the result that a much better product is produced than that which came from China.

There are very few dried whole eggs used in the United States. This product is dried in Dennison, Texas, and is used primarily in the manufacture of ice cream. It takes approximately 3.6 lb. of the liquid product to produce 1 lb. of the dry material. This product is manufactured by the spray process with certain modifications in the nozzles to produce the desired results. It is interesting to note that in a short time American chemists have already advanced the art, and a patent was issued to Dr. F. H. Clickner for a modified process which produces a much better dried material, more easily soluble than the one made in China.

Dried yolk in this country is made exclusively by the spray process, using various forms of the spray type of apparatus such as the Gray-Jenson or Merrel-Soule, which were used for the spraying of milk, with slight variations as to the spraying pressure as well as the temperatures. Practically all the plants with the exception of one are using the Gray-Jenson or the Merrel-Soule apparatus with certain modifications in the nozzles and pressures. Approximately 2.2 lb. of liquid yolk is required to produce 1 lb. of solid material.

Dried albumen is produced in this country by two different methods. The plants which have the spray system installed utilize the same apparatus for the manufacture of dried powdered albumen. In view of the fineness of the powder there is a considerable amount of loss and it takes approximately 10 lb. of liquid to produce 1 lb. of the dried material. There also is being manufactured in this country dried albumen in a granular as well as in a crystal form. In this case the tray system is used and the product is dried by blowing warm air over the wet albumen. Including factory loss, from 8 to 8¼ lb. of liquid egg white is required to produce 1 lb. of the dry product.

It is comparatively easy to dry whole eggs and yolk material. The general procedure, with the exception of very minor changes, is that used in spray drying of milk. It is more difficult, however, to dry the albumen alone.

The commercial value of albumen lies in its ability to produce a large volume of foam of a tenacious character. The greater the foaming properties of the albumen, the greater is its commercial value. Very little is known regarding the physical, chemical and colloidal properties of egg albumen, and most plants follow certain procedures empirically. The introduction of this industry into the United States is stimulating a considerable amount of research and pioneer investigation and there is no doubt that some fundamental properties will be discovered which will result in the production of a uniform product of high quality.

Already great advance has been made during the past year in the drying of egg albumen in this country, as evidenced by the fact that the domestic product possesses good foaming value with less objectionable odor.

It was learned that when ordinary fresh egg whites are dried the resultant product will not foam. If, however, the egg whites are subjected to a process

Ways to Evaluate the Properties of Egg Albumen

1. Determining the weight and specific gravity of foam. 2. Putting the foam in a funnel to measure the drip and determine its tenacity and stability (developed by The Emulsol Corp. laboratories). 3. Determining the pH of the liquid drained from 2, and of the dissolved egg albumen.

of ripening or fermentation, the resultant product will have excellent foaming value. Experiments made in our laboratory have shown that the fermentation process changes the physical colloidal properties of the albumen. An egg foam may be considered an emulsion or a dispersion of fine globules of air in an aqueous medium with the albuminous material being absorbed at the surface as envelopes which protect the air globules from coalescing. The more finely the air is subdivided, the greater will be the volume of the foam and the lower will be its specific gravity. The albuminous material, therefore, is the protecting agent which assists in subdividing the air and forms coatings at the surface, thus preventing the foam from collapsing. A foam may, therefore, be compared to a skyscraper. The air bubbles may be considered the bricks and the albuminous material may be considered the cement and steel framework which supports the entire building. The stronger the steel structure and cement, the more permanent will be the building. If the steel structure and cement weaken, the building will collapse. The same is true regarding the function of albumen in the foam.

As a result of experimental work, we may conclude that the function of the fermentation is to condition the albumen in such a manner that it will have elasticity and produce a large number of envelopes during whipping. If the albumen is not conditioned by a process of fermentation, its elasticity is decreased and its property as a cementing medium for the air globules is lowered.

In fermenting albumen, caution must be used to control the fermentation in such a manner as not to produce undesirable results. In this country a considerable amount of experimental work has already been done which makes it possible to control the process of fermentation so as to direct it into the most desirable channels, and to produce the best conditions for producing a tenacious foam.

Apparatus for testing the foaming value of egg albumen. A measured quantity is whipped for a definite length of time and the depth of foam measured on a ruler.

The foaming value of the egg whites is determined by whipping a certain quantity of egg whites, dissolved in water, for a definite length of time in a Hobart mixer and then measuring the height of the foam. Our laboratory has developed a method of determining the tenacity of the foam by filling a funnel of a definite volume with the foam and weighing it. The greater the volume of air which has been incorporated, the less will be the weight of the foam and the lower its apparent specific gravity. The liquid which will drip from the funnel within 15 or 30 minutes, respectively, is measured. The greater the tenacity of the foam, the lower will be its apparent specific gravity and the smaller the quantity of liquid which will separate in a given time interval.

Very delicate electrical apparatus is used to determine the slightest changes of acidity or the hydrogen ion concentration, a factor in the foaming and the stability of the foam. A considerable amount of research work is being done in our organization with the object of changing the albumen to make it more elastic and to increase its foaming value without the process of fermentation.

The egg-drying industry in this country is only one year old and has made wonderful progress. We have already sufficient plants to take care of all the requirements of dried eggs in the United States without importing even one pound from China. The commercial success obtained for the past year has stimulated many manufacturers to indulge in new investigation and research to place the entire industry on a scientific basis. From an economic standpoint a number of milk drying plants which were idle were profitably utilized for this new industry, thus giving employment to a number of men. It also had a tendency to absorb a large volume of eggs during the production period, thus preventing a further lowering of the price of commodities and giving the farmer a considerable return for his egg products. Technically speaking, the drying of eggs in the United States has been a phenomenal success.

Better Ways to Sterilize Equipment

Chemicals Are Cheaper Than Steam but They Vary Greatly in Price and Effectiveness

By P. D. WIDMER
San Francisco, Calif.

DURING the last few years the case for chemical sterilization has been contested from several angles. There has been much debate about why it should be used and why it should not be used. Chemical sterilization has passed the experimental stage, however. We find it being extensively employed in hundreds of food plants of all kinds handling meats, fish, oysters, milk, cream, ice cream, butter, cheese, beverages, margarine, fruits, vegetables and many other products.

Advantages? Yes. Savings in actual cost of sterilization; cleaner appearance and odor in the plant; less breakage in bottling, when chemical sterlization replaces that of steam; less losses caused by bacteriological spoilage; and last, but by far the most important, a saving is often made manifest in the charge for replacement of equipment.

In a large milk plant, which hereafter shall be referred to as plant "A," we find a typical argument for chemical sterilization from a dollars-and-cents standpoint.

Chemical Sterilization Reduces Breakage

The cost of steam sterilization on the pasteurization equipment alone in plant "A" was computed to be $2.75 per day. Today this same plant is using sodium hypochlorite with a daily cost of $0.33—a saving of $2.42 a day or $983.00 per year. However, this saving in actual cost of sterilization is negligible when the various other advantages are considered. Breakage in bottle sterilization by the use of live steam, for instance, was much higher than when chlorine was employed.

From a spoilage standpoint, also, chemical sterilization has considerable advantage over its rival, heat. It is commonly known that there are many spores of the type of *B. subtilis* and others that have a high heat-resistant quality, and when live steam is used, many parts of open equipment, such as surface coolers, are not and cannot be exposed to a temperature high enough to insure a complete germicidal action. However, when suitable chlorine liberators, such as sodium hypochlorite, are properly used, there is no possible chance for these troublesome organisms to survive.

Many recommendations may be found in the literature in regard to the desirable strengths of chlorine to be used. No doubt this factor is greatly affected by local conditions and whether the "flood" or "spray" system is employed.

The "flood" system is practical for usage in continuous-flow equipment, small vats (under 300 gal.) and long continuous sections of sanitary pipe. In plants where the continuous flow system is used, a large batch (250 to 500 gal.) of chlorine solution may be mixed in the receiving vat or any other tank that may be convenient, and then pumped or allowed to flow by gravity through the entire system.

It will be found that even if the equipment has not been thoroughly cleaned and free from organic matter the solution will not lose any of its strength while passing through the system, because there is enough of the solution to allow the pipe lines and smaller vats to be entirely flooded, and the equipment is entirely sterilized. Of course, it is better to have the equipment properly cleaned.

The "spray" method should be used on equipment that is either too large or unhandy for the "flood" system. A chlorine solution is prepared in a small tank and is then sprayed on the equipment by air pressure.

Of the two systems the "flood" is by far the safer and easier to use. However, there are times when the "spray" method is far more advantageous and should be employed. The "flood" method is based on the principle of entirely covering the sterilizing surface with the chlorine liquid, while the "spray" is merely the use of a spray gun, shooting the chlorine solution onto the surface of the equipment.

Flood System More Effective

When using the "flood" system a much weaker chlorine solution is used, ranging from 30 to 150 p.p.m. (parts per million), depending on the length of time that the solution is to be allowed to remain in contact with the walls of the tank, while in the "spray" system the chlorine solution should contain at least 170 p.p.m., as the germicidal action must take place immediately, before the solution has had a chance to run down the sides of the tank.

From a cost standpoint the two methods are about the same. More solution is used in the "flood," but it is of a weaker strength, while less is used in the "spray," with a higher available chlorine content.

The disadvantage of the "spray" method is that when the worker is spraying the equipment he may neglect to spray the entire tank.

therefore missing some spots that may be heavy in bacteria. The "flood" system, however, covering the entire surface of the tank, insures a complete germicidal action.

Plant "A" allows the chlorine solution to remain in contact with the equipment for a 40-minute period and uses a 50-p.p.m. solution in its system. A 35-p.p.m. solution would be quite strong enough, but for added safety a 50-p.p.m. solution is used with wonderful success. In the large 1,000-gal. glass-lined tanks, the "flood" system would not be practicable and therefore the "spray" is used with a 180-p.p.m. solution. Sterile water, run over the sides of the tank and then plated in the laboratory, shows that a sterile condition exists in the tanks after the use of the chlorine solution.

As we all know, there are many hypochlorite compounds on the present market, both in liquid and powder form, and it has been the experience of a number of workers that many of these compounds are worth thorough investigation. The main thing in which the operator is interested is securing a compound that will be stable, easy to handle and selling at the right price.

One will find these compounds selling at practically any price, and with as many compositions. However, the most important thing to consider is the actual cost per pound of available chlorine, for, after all, the plant operator is buying the compound for sterilization purposes and is therefore interested in securing a product that is both high in available chlorine and reasonable enough to bring the cost per pound of available chlorine within his grasp.

An example of the extreme prices that have been found on the present markets is offered in Table I.

Table I—Cost of Sterilizing Compounds

Product	Cost Per Pound (Market)	Cost Per Pound Available Chlorine
A	21c.	$8.70
B	48	.58
C	38	.60

It will be noticed that, of the three compounds listed in Table I, the cost per pound of available chlorine of "A" is considerably higher than that of "B" or "C." However, this compound is sold also as a washing powder (being high in tri-sodium phosphate) and is very handy for the small operator who chooses to wash and sterilize his equipment in one operation.

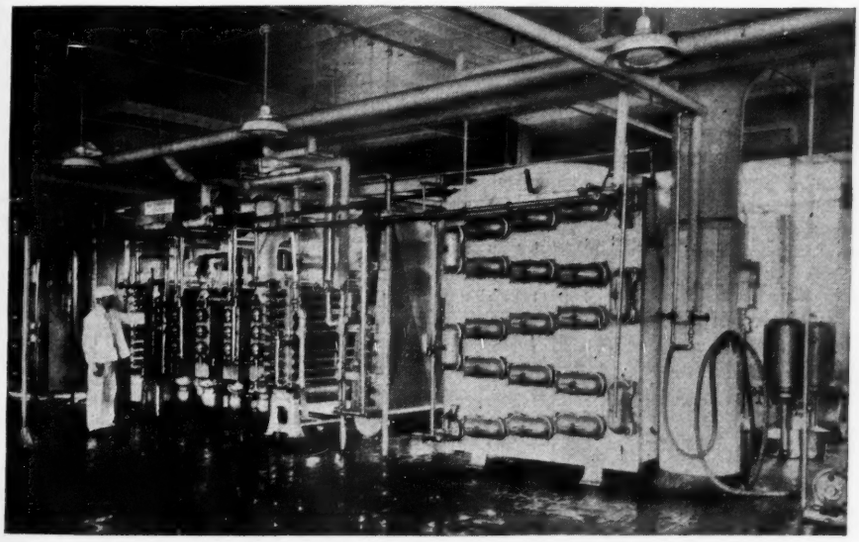
Some of us feel that 21 cents per pound for tri-sodium phosphate is a bit high, when we can buy it for a few cents a pound and mix it with either "B" or "C" with very little trouble. True, "A" is a remarkably fine product, but the same results may be obtained by using "B" or "C" with the addition of either tri-sodium phosphate or soda ash.

The operator who may be interested in determining the value of various compounds may easily do so by running a simple analysis for parts per million of available chlorine on any of the products on the market, and then compute the actual cost per pound of available chlorine.

When using some compounds it is necessary for the operator to add either tri-sodium phosphate or soda ash to keep down corrosion on his equipment. This is very simple procedure, and the plant superintendent who uses considerable hypochlorite will find that it will help his pocketbook to do so.

Chemists are continually developing new processes in which they may raise the sterilization efficiency of chlorine and at the same time cut the cost of the process to the operator. One of the latest of these "finds" along these lines is the addition of a small quantity of a weak acid. This acid is added to the solution so that it will have a pH of about 6.6. At this pH (which is just slightly acid) *B. subtilis* spores are killed at 10-p.p.m. strength, while 35 p.p.m. is required in the alkaline solution—a saving of 71 per cent of the material.

The question of corrosive effect of the acid chlorine has been raised along with this new "find," yet, after considerable experimental work, it was found that acid chlorine did not seem to have a greater corrosive effect than did the alkaline solution. Nevertheless, when the operator uses a chlorine solution in the acid form, he must be sure to add the acid in a weak form (about 1/20 N.) and add it to the solution just prior to its usage, as the acidified chlorine solution will lose its strength in a comparatively short time. This feature seems to be a detrimental factor in the usage of acid chlorine, but if handled properly it can easily be made to work with excellent results.



Equipment for wet operations in food processing must be cleaned and sterilized every day. What is the best way to do it?

Scrubbing Important

The main argument often heard against chemical sterilization is the inefficiency of chlorine in the presence of organic matter. This, of course, is true. Chlorine in the presence of a large quantity of organic material is handicapped to a great extent. The answer to this problem seems merely to be a matter of keeping the equipment in a clean as well as a sterile condition. Operators using chlorine should insist that a thorough scrubbing and cleansing be given the equipment before the application of the chemical sterilizer.

Many anti-chlorine investigators feel that when a plant worker knows that he will be able to use a chemical sterilizing agent, he will be negligent in his cleaning work. This is easy to avoid, as proper supervision and workmanship will eliminate this hazard.

TEXT OF THE BLANKET AGREEMENT FOR ALL INDUSTRIES

The "blanket agreement" for employers of labor, signed July 20 by President Roosevelt, reads:

PRESIDENT'S REEMPLOYMENT AGREEMENT

(Authorized by Section Va, National Industrial Recovery Act.)

During the period of the President's emergency reemployment drive, that is to say, from Aug. 1 to Dec. 31, 1933, or to any earlier date of approval of a code of fair competition to which he is subject, the undersigned hereby agrees with the President as follows:

1. After Aug. 31, 1933, not to employ any person under 16 years of age, except that persons between 14 and 16 may be employed (but not in manufacturing or mechanical industries) for not to exceed three hours per day, and those hours between 7 a.m. and 7 p.m., in such work as will not interfere with hours of day school.

2. Not to work any accounting, clerical, banking, office, service or sales employees (except outside salesmen) in any store, office, department, establishment or public utility, or on any automotive or horse-drawn passenger, express, delivery or freight service, or in any other place or manner, for more than forty hours in any one week and not to reduce the hours of any store or service operation to below fifty-two hours in any one week, unless such hours were less than fifty-two hours per week before July 1, 1933, and in the latter case not to reduce such hours at all.

3. Not to employ any factory or mechanical worker or artisan more than a maximum week of 35 hours until Dec. 31, 1933, but with the right to work a maximum week of 40 hours for any six weeks within this period and not to employ any worker more than eight hours in any one day.

4. The maximum hours fixed in the foregoing paragraphs 2 and 3 shall not apply to employees in establishments employing not more than two persons in towns of less than 2,500 population which towns are not part of a larger trade area; nor to registered pharmacists or other professional persons employed in their profession; nor to employees in a managerial or executive capacity, who now receive more than $35 per week; nor to employees on emergency maintenance and repair work; nor to very special cases where restrictions of hours of highly skilled workers on continuous processes would unavoidably reduce production, but, in any such special case, at least time and one-third shall be paid for hours worked in excess of the maximum. Population for the purposes of this agreement shall be determined by reference to the 1930 federal census.

5. Not to pay any of the classes of employees mentioned in paragraph 2 less than $15 per week in any city of over 500,000 population or in the immediate trade area of such city, nor less than $14.50 per week in any city of between 250,000 and 500,000 population, or in the immediate trade area of such city; nor less than $14 per week in any city of between 2,500 and 250,000 population or in the immediate trade area of such city; and in towns of less than 2,500 population to increase all wages by not less than 20 per cent, provided that this shall not require wages in excess of $12 per week.

6. Not to pay any employee of the classes mentioned in paragraph 3 less than 40 cents per hour unless the hourly rate for the same class of work on July 15, 1929, was less than 40 cents per hour, in which latter case not to pay less than the hourly rate on July 15, 1929, and in no event less than 30 cents per hour. It is agreed that this paragraph establishes a guaranteed minimum rate of pay regardless of whether the employee is compensated on the basis of a time rate or on a piecework performance.

7. Not to reduce the compensation for employment now in excess of the minimum wages hereby agreed to (notwithstanding that the hours worked in such employment may be hereby reduced) and to increase the pay for such employment by an equitable readjustment of all pay schedules.

8. Not to use any subterfuge to frustrate the spirit and intent of this agreement, which is, among other things, to increase employment by a universal covenant, to remove obstructions to commerce, and to shorten hours and to raise wages for the shorter week to a living basis.

Agreement as to Prices

9. Not to increase the price of any merchandise sold after the date hereof over the price on July 1, 1933, by more than is made necessary by actual increases in production, replacement, or invoice costs of merchandise since July 1, 1933, or by taxes or other costs resulting from action taken pursuant to the Agricultural Adjustment Act, and, in setting such price increases, to give full weight to probable increases in sales volume and to refrain from taking profiteering advantage of the consuming public.

10. To support and patronize establishments which also have signed this agreement and are listed as members of the N. R. A. (National Recovery Administration).

11. To cooperate to the fullest extent in having a code of fair competition submitted by his industry at the earliest possible date and in any event before Sept. 1, 1933.

12. Where, before June 16, 1933, the undersigned had contracted to purchase goods at a fixed price for delivery during the period of this agreement, the undersigned will make an appropriate adjustment of said fixed price to meet any increase in cost caused by the seller having signed this President's reemployment agreement or having become bound by any code of fair competition approved by the President.

13. This agreement shall cease upon approval by the President of a code to which the undersigned is subject; or, if the N. R. A. so elects, upon submission of a code to which the undersigned is subject and substitution of any of its provisions for any of the terms of this agreement.

14. It is agreed that any person who wishes to do his part in the President's reemployment drive by signing this agreement but who asserts that some particular provision hereof, because of peculiar circumstances, will create great and unavoidable hardship, may obtain the benefits hereof by signing this agreement and putting it into effect and then, in a petition approved by a representative trade association of his industry, or other representative organization designated by N. R. A., may apply for a stay of such provision pending a summary investigation by N. R. A., if he agrees in such application to abide by the decision of such investigation. This agreement is entered into pursuant to Section 4 (a) of the National Industrial Recovery Act and subject to all the terms and conditions required by Sections 7 (a) and 10 (b) of that act.

Dated 1932

(Sign here) .....
(Name)
.....
(Official position)
.....
(Firm and corporation name)
.....
(Industry or trade)
.....
(Number of employees at the date of signing)
.....
(Street)
.....
(Town or city) (State)

The Food Manufacturer Becomes a Tax Collector

PROCESSING taxes are now in effect. Food manufacture joins the growing list of industrial tax collectors. Not news, to be sure; but the full implications of the developments certainly have not yet been generally appreciated, perhaps not even in the Agricultural Adjustment Administration.

Current developments require consideration from the standpoint of their effect on inter-food competition quite as much as the consequence in the direct cost of food manufacture. Wheat-processing taxes illustrate this most directly. But even in the processing tax on cotton, which is to further the acreage curtailment program, we find an effect through the indirect consequence of curtailed cottonseed supply for crushers and prospective rise in the price of the cottonseed oil. The cotton tax also adds about 2½ cents per barrel of flour to its cost when it is shipped in cotton bags.

Wheat Tax

Wheat acreage curtailment contracts are planned for next year. The compensation to farmers who sign up—Uncle Sam's "preferred list"—will begin about Sept. 15. The money is already being collected from the first processors of wheat at the rate of 30 cents per bushel. The aggregate amount to be collected will be approximately $150,000,000 per year. This sum will then all be available for compensating for acreage curtailment by not more than 20 per cent of the average acreage during the last three years. At this time, it looks as if it will continue for the next three wheat-marketing years.

In accordance with the law creating A.A.A., there are only three exempted from the tax: (*a*) wheat processed by or for the producer for consumption by his own family, employees or household; (*b*) wheat processed for products used for charitable distribution; (*c*) wheat grinding or cracking for feed. An important industrial exemption from the tax may be made if the Secretary finds that any class of other products is of such low value that imposition of the tax prevents, in whole or in large part, the use of wheat in the manufacture thereof, and thus substantially reduces wheat consumption. No such exemptions have yet been undertaken.

The wheat processors will, of course, pass on the tax in the form of increased prices for products. He is at liberty to distribute this burden in any way that he chooses. Presumably, however, feed products made will carry little or none of the price increase, because they are competitive with other untaxed feeds. It is in accordance with this general idea that the department has not placed any compensating taxes on floor stocks or any import tax on bran, shorts or middlings.

Products Taxes

When the law took effect there were floor stocks of wheat products which automatically were subject to a tax. This was in each case equivalent to the amount of wheat entering into their manufacture. If, for example, a bushel of wheat makes 42 lb. of a product, such as noodles, then this 42 lb. of floor stock must pay a tax of 30 cents. The accompanying tabulation shows the conversion factors announced in the Treasury decision effective July 9 covering all wheat products.

Imported wheat products bear an analogous tax of the same amount *in addition to whatever duty they may normally carry.* Thus imported goods made from wheat not subject to the process tax are put on a parity with domestic goods made domestically.

The Tax Base

The 30-cent tax rate was fixed by Secretary Wallace in accordance with the law. The calculation was based on data as of June 15, the last date for which official figures applicable were then available. On June 15, the farm price (not the market price) for wheat was approximately 59 cents. In the base period, 1909-1914, the corresponding farm price was approximately 88 cents. But this latter figure had to be modified by the fact that on June 15 this year the latest available official price index of the goods purchased by the farmer was 101, as compared with 100 in the pre-war base period. Hence the equivalent present "fair exchange value" of wheat was 101 per cent of 88 cents, or approximately 89 cents. The tax, therefore, by law was the difference between this fair exchange value and the prevailing farm price (89c. minus 59c.) or 30 cents.

The calculation of the equivalent taxes on wheat products, as given in the accompanying table of conversion factors, depends solely on the relative weight of the wheat used and the weight of the finished product made directly or indirectly therefrom.

Tax Rate Changes

The Secretary of Agriculture may amend the 30-cent tax rate when in his judgment it is deemed necessary. The amendment may reduce the tax below that calculated by the above formula; but it may not make it greater than the amount necessary to accomplish adjustment between fair exchange value and prevailing farm price at the time of change. It is interesting to note that were the Secretary to calculate the tax, as of late

July, it might be that there would be no tax possible. This does not, however, afford the industry any basis for claiming that the tax must be either reduced or abandoned, since presumably it was correctly calculated as of June 15 when adopted.

Even though cash wheat was currently sold on the average as high as $1.12 late in July and probably had a farm price equal to the adjusted fair exchange value, between 90 and 95 cents, an abandonment of the tax was economically impossible. The administration has committed itself to acreage contracts. The payment to farmers for acreage curtailment must come from the processing tax. To stop collecting would leave the government with obligations to pay, but without the source of funds provided in the act.

Regardless of the future price of wheat, even if it goes above parity, it is expected that the processing tax will continue at the 30-cent rate for some time to come, perhaps a full year. This inevitably increases the price of the milled products, but has a major compensating advantage to the miller. It makes definite the prospective basis of milling costs with respect to tax. This makes hedging in wheat purchases possible on the customary basis without the great uncertainty of a fluctuating tax.

Competing Materials

The rapid July rise in the cost of wheat flour automatically afforded an advantage for competing cereal products, such as rye flour, corn meal and corn flour. All of these were initially tax free. The wheat miller naturally wished this situation corrected under the section of the law which provides for taxing a competing material to prevent curtailing the market for the basic wheat products when the processing tax becomes an important factor in their market price. The delay in imposing the initial compensating taxes on rye, barley and corn milled for meal or flour undoubtedly has partly accounted for the relatively more rapid rise of those grains in the period immediately following the imposition of the tax on wheat. A compensating tax on the competing materials will, of course, readjust price relations nearer to normal.

Cottonseed Oil

Curtailment of cotton acreage automatically meant curtailment of cottonseed, by an estimated 20 per cent. The significance of this decline in cottonseed supply must be seriously considered by cottonseed crushers and cottonseed-oil users in the food business.

This cut in gross supply of 20 per cent probably means only half that percentage reduction in crushable seed. With a demand more nearly approximating total supply, there will inevitably be less wastage and less feeding of uncrushed seed. The supply withheld for the next season's planting also is a factor.

A reduction of cottonseed supply of this magnitude would be very serious were it not for the substantial carryover in oil stocks. It is estimated that these reserves are sufficient, together with prospective crops, even as curtailed, to supply normal market requirements of cottonseed oil for two or three years at least. Therefore no actual shortage of cottonseed oil is expected, though some price rise may result.

The imposition of a processing tax on cotton places no tax on the seed or its products. The only effect on price is that which is incident to curtailed raw-material supply. It should be understood, however, that cottonseed oil can be taxed as a competing material if either butter or lard is to be later subject to a processing tax under other actions of the administration. It seems certain that when the time comes to arrange taxes on dairy products and hog products, the vegetable oils will be subject to the same sort of consideration as to competing-materials taxes as rye is now receiving in its competition with wheat. It might seem that cottonseed oil, already affected by curtailment of raw material, would escape at that time; but this is not likely. The administration policy in international relations, as reflected in imported oils competitive with cottonseed, may become a determining factor in that connection.

Table of Conversion Factors

(Treasury Decision 4371)

"This table of conversion factors fixes the percentage of the per bushel processing tax on wheat with respect to 100 pounds of the following articles processed from wheat. These percentages are based upon a basic conversion factor of 4.6 bu. of wheat as equaling 196 lb. of the flour designated in item 1(b) below.

Articles processed from wheat	Conversion factors
Products of first domestic processing:	
1. Flour:	
(a) Whole wheat and graham	166.67
(b) All flour except whole wheat and graham	234.7
(c) Semolina and farina	234.7
2. Prepared flour:	
(a) Doughnut	133.8
(b) Biscuit	223.0
(c) Pancake	164.3
(d) Pie crust	140.8
3. Cereal preparations made chiefly from wheat:	
(a) Whole wheat type, including those consisting chiefly of whole wheat	166.67
(b) All others except those consisting chiefly of bran	234.7
Products of secondary processing:	
4. Bread:	
(a) All bread except rye	161
(b) Rye	120
(c) Zwieback	154
(d) Rolls, all types, and coffee cake	161
5. Crackers	230
6. Pretzels	244
7. (a) Macaroni and spaghetti, except canned	250
(b) Canned macaroni and spaghetti	62.5
8. Noodles	238
9. Paste	185.8
10. Foundry molding materials.	132.0"

Par. E. The amounts of tax imposed or refund to be made with respect to certain articles processed wholly or in chief value from wheat, as determined upon the basis of the determination by the Secretary of Agriculture of a processing tax rate of 30 cents per bushel of 60 lb. and of his prescription of conversion factors in his regulations set forth in Par. D above, are as follows:

Article processed from wheat	Rates of Tax (Cents per pound)
Products of first domestic processing:	
1 Flour:	
(a) Whole wheat and graham	.500 = ½ cent
(b) All flour except whole wheat and graham	.704
(c) Semolina and farina	.704
2. Prepared flour:	
(a) Doughnut	.401
(b) Biscuit	.669
(c) Pancake	.493
(d) Pie crust	.422
3. Cereal preparations made chiefly from wheat:	
(a) Whole wheat type, including those consisting chiefly of whole wheat	.500
(b) All others except those consisting chiefly of bran	.704
Products of secondary processing:	
4. Bread:	
(a) All bread except rye	.483
(b) Rye	.360
(c) Zwieback	.462
(d) Rolls, all types, and coffee cake	.483
5. Crackers	.690
6. Pretzels	.732
7. (a) Macaroni and spaghetti, except canned	.750
(b) Canned macaroni and spaghetti	.188
8. Noodles	.714
9. Paste	.557
10. Foundry molding materials	.396

Forms for Use With Wheat Processing Tax

Form No.	*Designation*	*Required by*
P. T. Form 1	Processing Tax Return	Regulations 81, Article 11.
P. T. Form 11	Return of Compensating Tax on Imports	Regulations 81, Article 20.
P. T. Form 24	Claim for Refund under Agricultural Adjustment Act	Regulations 81, Articles 30, 31(a), 32. Regulations 82, Articles 19, 20.
P. T. Form 31	Floor Tax Inventory and Return, by a person other than one engaged in retail trade, by a person engaged in retail trade if articles are held by him elsewhere than in his retail stock	Regulations 82, Article 11.
P. T. Form 41	Floor Tax Inventory, Record and Return, by a person engaged in retail trade	Regulations 82, Article 16.
P. T. Form 28	Claim for credit on monthly return	Regulations 81, Article 31(b).
P. T. Form 51	Monthly Statement of Importer of Wheat Products	Regulations 81, Article 21.

When Making Your Codes and Agreements

HERE IS THE PROCEDURE:

THE preparation of Codes, Industry Agreements, Marketing Agreements, and licensing plans by food manufacturers will all be carried out under Secretary of Agriculture Wallace through A.A.A. (Agricultural Adjustment Administration). It makes little difference at the outset whether the ultimate goal is a Code or an Agreement, whether licensing is included or not, substantially the same procedure is followed. The decision as to the form of the ultimate action is more likely to rest with A.A.A. than with the applicant industry in any event.

The accompanying flowsheet outlines the major successive steps in the procedure from the first meeting of industry until the final official action has been promulgated. The first three stages are taken by industry itself before any contact need be made with the government. But even in this early stage the cordial cooperation of A.A.A. is gladly afforded. The ideas of industry as to needed corrections in trade practice would in any event be the basis of first discussion.

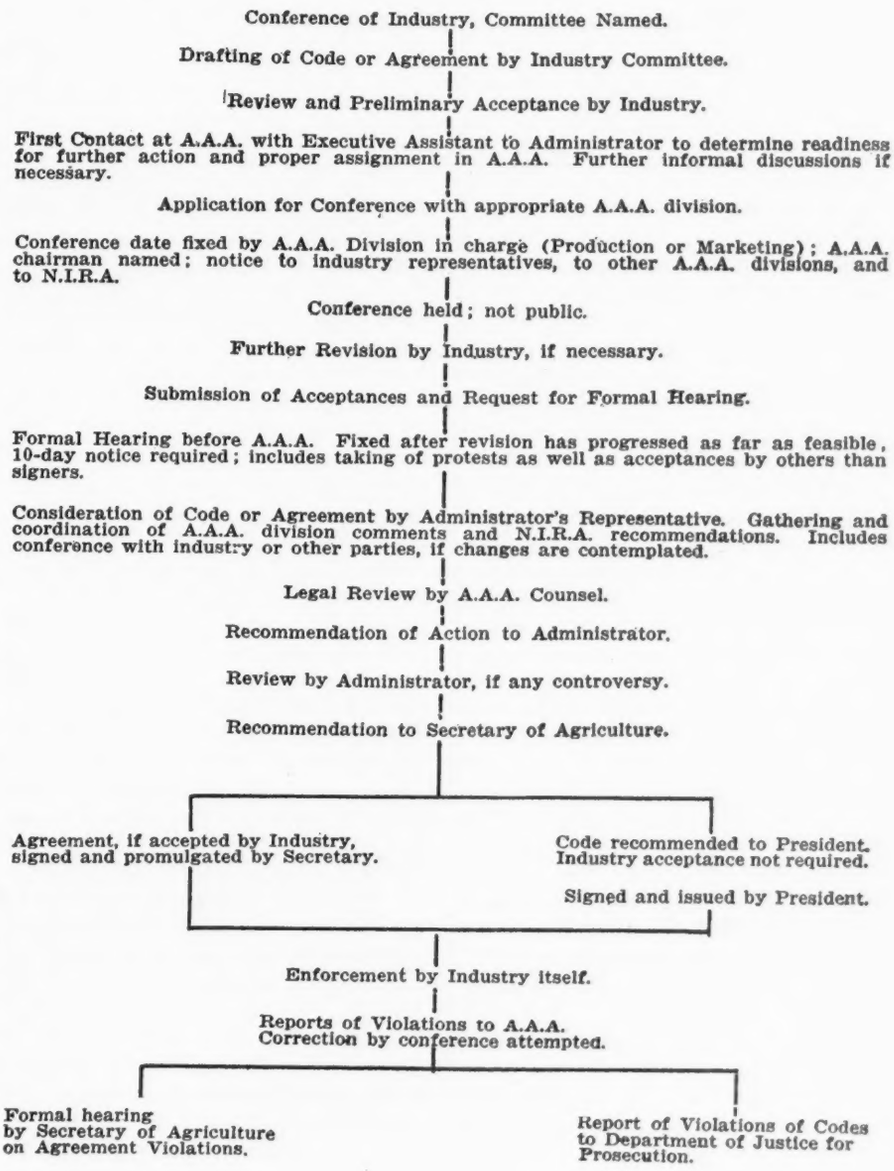
Plans for Control Invited

Industries are invited to submit proposals affecting any phase of their business which they believe needs correction, together with their ideas as to effective measures of control. Such subjects as secret discounts, selling below cost, loss leaders, and the multitude of other subjects discussed during recent years in trade practice codes are all eligible for consideration here. If an industry believes licensing is the only remedy it may request that action. But A.A.A. believes that as much should be accomplished without licensing as is possible, since self-policing of industry is the basic desire in all this administration effort.

In contrast with actions which can be taken under N.I.R.A., it is entirely feasible under A.A.A. to have regional or subsidiary group action where subordinate divisions of an industry can accomplish the desired result without awaiting more general agreement or national codes. The tendency with reference to the production and distribution of raw foods is to establish regional agreements, but to cover the manufacture and distribution of processed foodstuffs in national agreements or codes. For example, in marketing fluid milk, purely regional actions have been found expedient, one for each major milk shed. General industry plans of national scope, however, are preferred where possible; required if the problem attacked is national in significance.

Unless a blanket code affecting wages and hours of labor under N.I.R.A. has been accepted by a food industry it will always be necessary to make such labor provisions specifically a part of its plan for action under A.A.A. Usually general code provisions of this sort will become an integral part of any specific industry code handled under Secretary Wallace.

FLOW DIAGRAM
Normal Procedure in Formulating Codes and Agreements


Conference of Industry, Committee Named.
Drafting of Code or Agreement by Industry Committee.
Review and Preliminary Acceptance by Industry.
First Contact at A.A.A. with Executive Assistant to Administrator to determine readiness for further action and proper assignment in A.A.A. Further informal discussions if necessary.
Application for Conference with appropriate A.A.A. division.
Conference date fixed by A.A.A. Division in charge (Production or Marketing); A.A.A. chairman named; notice to industry representatives, to other A.A.A. divisions, and to N.I.R.A.
Conference held; not public.
Further Revision by Industry, if necessary.
Submission of Acceptances and Request for Formal Hearing.
Formal Hearing before A.A.A. Fixed after revision has progressed as far as feasible, 10-day notice required; includes taking of protests as well as acceptances by others than signers.
Consideration of Code or Agreement by Administrator's Representative. Gathering and coordination of A.A.A. division comments and N.I.R.A. recommendations. Includes conference with industry or other parties, if changes are contemplated.
Legal Review by A.A.A. Counsel.
Recommendation of Action to Administrator.
Review by Administrator, if any controversy.
Recommendation to Secretary of Agriculture.
Agreement, if accepted by Industry, signed and promulgated by Secretary.
Code recommended to President. Industry acceptance not required.
Signed and issued by President.
Enforcement by Industry itself.
Reports of Violations to A.A.A. Correction by conference attempted.
Formal hearing by Secretary of Agriculture on Agreement Violations.
Report of Violations of Codes to Department of Justice for Prosecution.

Food Processors and Distributors Flock to A.A.A. With Codes

A SCORE of food producing, processing and distributing groups now are working with A.A.A. The marketing agreement of the California cling peach packers was the first to reach formal hearing (July 31). Other California deciduous fruits, except apples, are covered by an agreement scheduled for hearing Aug. 1. A committee would be set up to regulate the quantity of fruits entering marketing channels in view of supply and demand conditions during any fixed period, and to allocate to each shipper the tonnage which he may receive from growers for marketing. The agreement is accompanied by a code including labor provisions.

Discussion has reached a documentary stage with reference to hogs, packing-house products, poultry, fresh fruits and vegetables, evaporated milk, fluid milk, cottonseed oil, mayonnaise, confectionery, coffee, cotton ginning, tobacco and pecans.

Bread bakers are working on a national basis but have not yet submitted their agreement to the A.A.A. Two groups of speciality bakers—New York City and Massachusetts—are pushing through the preliminary conference stage. Canners, preservers, fish marketers and the manufacturers of margarine, macaroni, flour, carbonated beverages and breakfast cereals, among others, have contacted with the A.A.A. Several of these groups have drafted tentative marketing agreements or codes, but are not yet ready to put them through official channels.

Chain stores and food chains are reported by A.A.A. to be cooperating. All food distributors, including restaurants, are working toward agreements. Shrimp canners and sardine packers will subscribe to the code of the National Canners' Association, with supplementary provisions relating to their peculiar problems. The Margarine Institute reports that a code will be presented to the A.A.A. when its provisions are brought into harmony with codes covering other products manufactured by margarine makers. A central committee will be established to represent the industry in proceedings under the A.A.A.

The American Bottlers of Carbonated Beverages are drafting a code for presentation to N.R.A. that eventually may be referred to the A.A.A., as it fixes wholesale price minimums. This is regarded as essential in the carbonated beverage industry because 5 cents is the ceiling in retail prices. The code will include provisions on wages and hours, a perplexing question because of the anomalous status of driver-salesmen. Suppression of unfair competitive practices will be included in the code as submitted to N.R.A. following acceptance by thirteen district organizations and state associations.

The marketing agreement of the National Cottonseed Products Association is hanging fire pending agreement on labor provisions. Because of excess crushing capacity, coupled with reduction of seed supply due to curtailment of cotton acreage, the agreement proposes allotment of seed among oil mills under terms worked out by eleven regional committees and approved by the Administrator. Publication of prices bid or paid for seed is proposed. The association invites licensing of all mills in the event that a national administrative committee fails to obtain compliance with the terms of the agreement.

Meat packers are pushing for an agreement among themselves and with hog producers to avoid, if possible, a processing tax on pork products. But a tax appears to be certain. With a large fall farrow in prospect, A.A.A. is considering a proposal to distribute the proceeds of the tax as a premium to bring brood sows to market. This raises the question whether the market could stand such a huge increase in pork supply. The hog tax also calls for compensatory taxes on cattle and sheep, and that raises the question of what to do with old ewes and dairy cows. The processing tax also brings up the question as to whether the levy will in the end be paid by the farmer himself. Inasmuch as pork must be moved at a price, the packer may not be able to pass the tax on to the consumer, which means that it would have to come out of the price to the producer. Furthermore, since the processing tax is refundable on exports, the higher the tax the greater will be the proportion of the total cost of the hogs that reverts to the export packer. The A.A.A. has not yet thought its way through this long train of consequences.

The National Canners' Association has received a satisfactory response from its membership on its proposed marketing agreement, plus a code of fair competition, but revision is still in progress. The marketing agreement would set up a processors' committee and commodity subcommittees to fix price differentials for established grades, territorial price differentials, freight equalization, minimum prices to be paid for crops, both maximum and minimum price limits for manufactured products, and the wages of labor. Specific plans governing the application of these policies to particular commodities would be filed by the processors as supplements to the general agreement. All processors would be required to post their prices with the appropriate commodity subcommittee. Because of the seasonal character of the canning industry, the association is seeking an exception from prescribed maximum hours in any one day or days in any one week during specified periods. The code also proposes that prevailing conditions in a locality should be considered in fixing wage rates.

Master Code for Foods Submitted to Industry

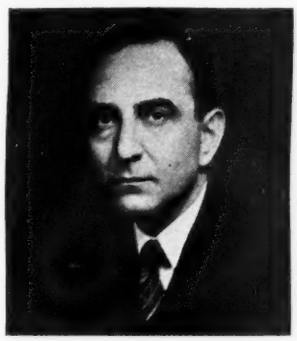
The proposed master code for all food industries, sponsored by the Associated Grocery Manufacturers' Association, was submitted to the distribution groups for their approval or revision on July 24 in New York. The meeting, which was held privately, included representatives of the National Association of Voluntary Chains, National Retailer-Owned Wholesale Grocers, National American Wholesale Grocers' Association, National Chain Store Association, National Association of Retail Grocers, and National Food Brokers' Association.

After this group has agreed on the distribution features, the next move is to submit it to the various industrial groups in the food field for approval.

It is believed that a representative committee of the grocery industry will be appointed to administer the code.

Group of 29 Food Men To Advise A.A.A.

AT a meeting of the representatives of the major food processing and distributing industries of the country, called by Charles J. Brand, coadministrator of the Agricultural Adjustment Administration, a committee of 29 leaders of the food industry was organized to advise the administration as to conditions in the various industries. Announcement of the committee followed the informal meeting of the members with Charles J. Brand and William I. Westervelt.



R. R. DEUPREE
Chairman, Advisory Committee

In view of the desire of the administration executives to prepare for a uniform and balanced approach to problems of the food processing and distributing industries, the representative committee, acting in an advisory capacity, is expected to correlate the work of different branches of the food industry through the formulation of policies as similar as possible. The committee, as organized thus far, has the following membership:

Earl D. Babst, chairman of the board, American Sugar Refining Co.; Colby M. Chester, president, General Foods Corp.; J. S. Crutchfield, president, American Fruit Growers, Inc.; R. R. Deupree, president, Procter & Gamble Co.; A. C. Dorrance, president, Campbell Soup Co.; S. M. Flickinger, president, S. M. Flickinger Co.; A. F. Goodwin, chairman of the board, First National Stores; John A. Hartford, president, Great Atlantic & Pacific Tea Co ; Howard Heinz, president, H. J. Heinz Co.; A. T. Johnston, president, Borden Co.; F. E. Kamper, president, C. J. Kamper Grocery Co.; J. H. Kline, Housom Kline Co.; M. Lee Marshall, chairman of the board, Continental Baking Corp.; W. M. D. Miller, president, Pennsylvania Grocers' Association; G. M. Moffett, president, Corn Products Refining Co.; J. W. Morey, president, Morey Mercantile Co.; A. H. Morrill, president, Kroger Grocery & Baking Co.; Walworth Pierce, president, S. S. Pierce Co.; F. S. Snyder, formerly chairman of the board, Institute of American Meat Packers; S. L. Stix, vice-president, Seeman Bros.; John Stuart, president, Quaker Oats Co.; G. F. Swift, president, Swift & Co.; C. C. Teague, president, California Fruit Growers' Co.; R. E. Tomlinson, president, National Biscuit Co.; Karl Triest, president, Haas Baruch & Co.; Fred Wolferman, president, Fred Wolferman, Inc.; Leonard E. Wood, president, California Packing Corp.; Samuel Zemurray, managing director, United Fruit Co.

The officers of the board are: R. R. Deupree, chairman; John Stuart, treasurer; A. C. Dorrance, secretary pro tem; and A. F. Goodwin, Howard Heinz and Fred Wolferman, vice-chairmen. The responsibility for executive control was voted to an executive board of seven; Colby M. Chester, Howard Heinz, Francis E. Kemper, Albert H. Morrill, S. L. Stix, G. F. Swift, and Samuel Zemurray. Delegated by Administrator Brand, R. R. Deupree will be an ex-officio member of the board, with Gordon C. Corbaley, president, American Institute of Food Distribution, as his assistant.

Salient Facts Regarding A.A.A. Food Regulation

1. Food manufacture and distribution will be governed by agreements, codes and licenses, all fixed under the Agricultural Adjustment Administration. All N.I.R.A. authority has been transferred by Presidential order.

2. Agreements entered voluntarily by industry will be given preference in all cases. Where compulsion is essential, a code will be adopted. The subject matter of an agreement may be identical with a code, and the procedure for adoption differs but slightly (see page 315 of this issue).

3. Licenses governing production or distribution will be put into effect only when other means for enforcement of agreements and codes have failed or appear certain to be ineffective. Licenses adopted for certain great milk sheds were necessary to eliminate armed controversy; as such they were emergency measures, not to be regarded as typical of A.A.A. policy.

4. Food industries are expected, and urged, to accept the President's blanket labor code program. But that does not supersede the drafting of agreements or codes. These latter will, when effective, supersede the blanket agreement.

5. Other industries' first obligation is to extend employment and to increase payrolls; but for food industries the compensation of agriculture for food raw materials is equally, if not more, important. Thus, food manufacture bears a double burden.

6. Price increases resulting from new wage and tax burdens are frankly anticipated. Administration officials recommend inclusion of contingent clauses covering these matters in any forward contracts both for purchases and for sales. The effort is to restrict such increases to actual burdens assumed and to eliminate pyramiding. The Secretary of Agriculture has authority to promulgate information bearing on this point intended to embarrass the profiteer. Another section of the act provides that vendees must accept billing above contract prices in an amount equivalent to the processing tax imposed. This provision amounts to a blanket amendment of all contracts relating to commodities affected by these processing taxes.

7. Merchandising agreements under A.A.A. are being welcomed. Cooperation of chain-store distributors has been promised. Thus far little tendency to stand on technicalities of intrastate rights has been shown by anyone.

8. Highly seasonal manufacture like canning will escape most of this year's troubles by the late date at which codes and agreements can take effect. No one yet knows how their problems of long hours for short periods can be solved next year.

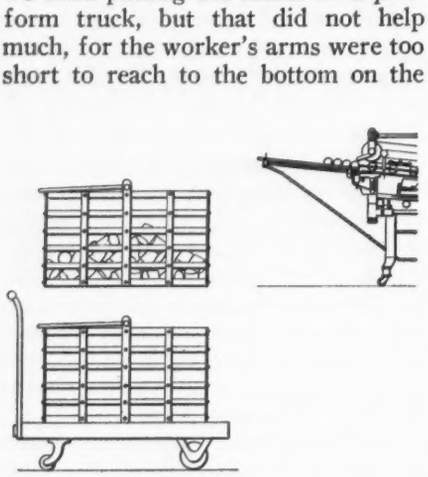
9. Labor problems of driver salesmen, common to bread, milk, beverage and like industries, will demand special attention. No clear policy or adequate solution for the long hours involved has yet been developed (July 25). The wage question for these groups is not serious, as substantially all receive far more than the proposed minimums. The more highly seasonal the problem, the more difficult it is to solve.

10. The general rise in factory and office wages which will result from the wide acceptance of the President's blanket labor code creates a new agricultural problem. It may even deplete the ranks of agricultural labor should many new employees be needed; it certainly will raise the wage standards and thus by competition raise farm labor costs. To this extent it will work contrary to the first purpose of A.A.A. —i.e., the improvement of the farmers' financial opportunity.

IDEAS . . . FROM PRACTICAL MEN

Faster Feeding of Labeler

At our small factory we use women to feed cans from crates into the labeling machine. They become tired stooping over crates on the floor, and the work goes pretty slowly after the first 2 or 3 hours. To overcome this we tried putting the crates on a platform truck, but that did not help much, for the worker's arms were too short to reach to the bottom on the



far side. We finally solved the problem by building on the truck a subframe that would hold the crates tilted up. The work now goes about three times as fast as before.

Where the retort crates can be carried on an overhead tram (which is possible only where the ceilings are high) the same effect can be obtained by tilting the kettle and fastening it in that position with a hook. The truck has the advantage that it can be wheeled around to any desirable location.

F. V. DOVER, *Seattle, Wash.*

NEED MONEY?

In nearly every plant are to be found one or more methods or devices that come under the category of practical ideas. And subscribers can obtain money easily by describing one of those ideas in a letter to *Food Industries*. Please inclose sketches or photos.

Patented devices, or those expected to be patented, should not be submitted.

Remuneration starts at $3.

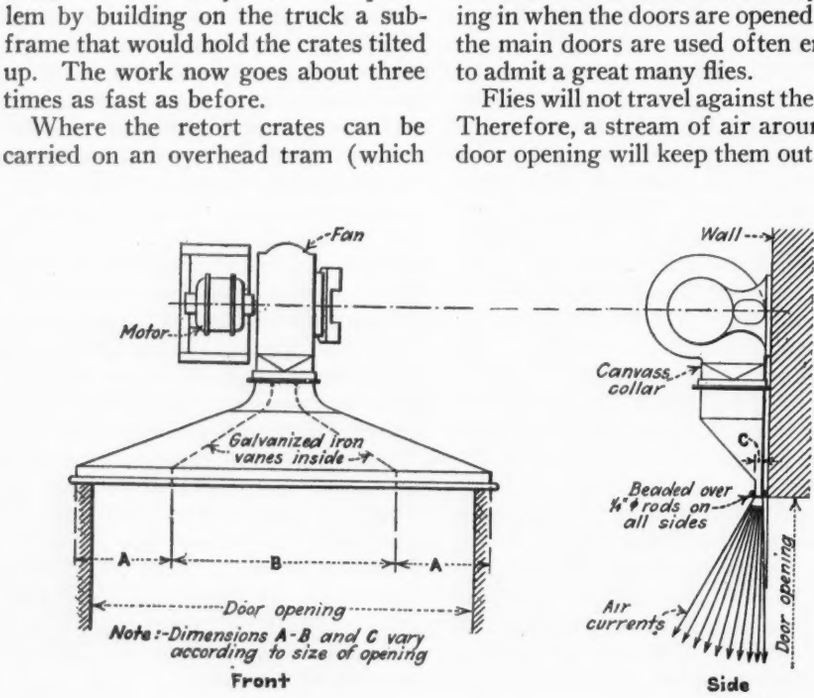
—The Editors

Fly-Chasing Apparatus

Flies—the bane of every food plant superintendent—can be largely eliminated by using a fly blower over the main doorways. Most manufacturers have their plants adequately screened, so the flies make their entrance by coming in when the doors are opened. And the main doors are used often enough to admit a great many flies.

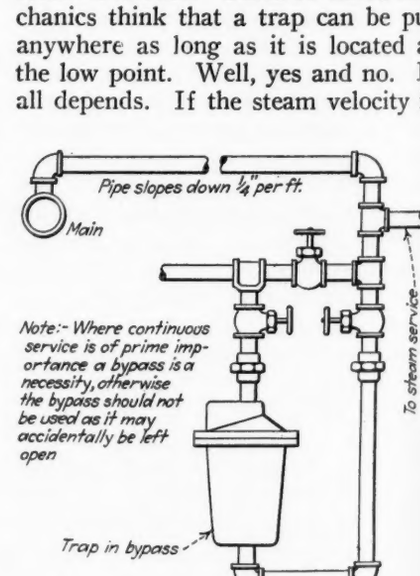
Flies will not travel against the wind. Therefore, a stream of air around the door opening will keep them out. The accompanying sketch represents an arrangement designed for this purpose. A fan is inclosed in a housing located above the doorway and extending the entire width of the door. The aperture at the bottom of this housing is so designed that the blast of air completely surrounds the door opening. The aperture, being restricted in width, permits a certain amount of air pressure to build up within the housing, assuring a draft all around the doorway. The use of compressed air is not necessary, but the air should have a velocity that provides adequate protection against the ingress of the pesky fly. The proper velocity will not be objectionable to the plant personnel.

VICTOR BUHR, *Equity Construction Co., New York, N. Y.*



Where to Place Steam Traps

Very frequently it becomes necessary to run a new steam line somewhere, and, of course, it must be trapped and drained if dry saturated steam is needed. Some so-called mechanics think that a trap can be put anywhere as long as it is located at the low point. Well, yes and no. It all depends. If the steam velocity is


Pipe slopes down ¼" per ft.
Main
Note:- Where continuous service is of prime importance a bypass is a necessity, otherwise the bypass should not be used as it may accidentally be left open
To steam service
Trap in bypass

high, it will cause any condensate in the pipe to flow along with it regardless of whether the travel is uphill or downhill.

The right way is to let the pipe slope slightly downhill in the direction of travel of the steam so that the water will be carried with it. Then the trap is put at the far end.

E. V. ROBERTS, *Brooklyn, N. Y.*

Three Good Ways to Reduce Truck Accidents

MANY large fleet owners in the food field have come to the conclusion that one of the most effective methods to reduce truck accidents is to make the drivers who are at fault feel the effect of such accidents in their own pocketbooks. There are several ways of doing this. Some companies make the drivers take time off without pay. Others charge to the drivers the cost of repairs to company trucks. Still other companies pay monthly bonus awards to drivers who do not have any accidents and withhold such payments from drivers who do have accidents.

Each of the above methods touches the drivers' pocketbooks. Experience has shown that this has a decided tendency to make the drivers more careful and to reduce the number and severity of the accidents.

Details of Two Plans

In this connection, the detailed plan followed by E. John Dugan, manager of transportation for Dugan Brothers, Newark, N. J., has resulted in a large reduction in the number of accidents, the summary of which will be published in a subsequent issue of FOOD INDUSTRIES.

In the Dugan plan, the driver having an accident is brought before a traffic court consisting of the two company sales managers, the controller, a branch station manager and E. John Dugan as chairman. The accident is reviewed from all angles and if it is voted that the driver is responsible, the cost of repairs to the company's truck is charged to him. A small amount is deducted from the driver's wages each pay day until the bill is fully paid.

A somewhat different problem is encountered when the fleet consists of passenger cars operated by salesmen who keep their cars at or near their homes and depend entirely upon local service stations for vehicle maintenance.

The General Foods Sales Co., New York City, which operates about 950 coupés or light panel trucks in the manner described in the preceding paragraph, has obtained a satisfactory solution of the accident-reduction problem by close personal contact between the driver-salesman and the district managers.

According to C. L. Jones, of the automobile division of the company, the personal contact method is preferable to that of penalizing by days off without pay or charges for accident repairs. It should be added that it is always possible for a salesman to recover some of his losses through the medium of his expense accounts.

As proof of the desirability of the personal-contact method, Mr. Jones states that in 1932 an average of 935 driver-salesmen covered a total of 15,750,000 miles with a total of 385 accidents reported, or 44,000 miles per accident.

[Editor's Note: The reply of Henry J. Mineur, safety director, the Borden Co., as to how that company employs drivers' days off without pay to reduce accidents was received too late for inclusion in these pages. It will be published in a subsequent issue.]

Segregate Accident Repair Costs If You Would Reduce Them

YOU can't hit what you can't see, is a sort of David Harum expression which has its application in motor vehicle maintenance, especially in relation to the cost of repairs due to accidents.

In many fleets in the food field, the maintenance superintendent grumbles when his mechanics have to make repairs due to accidents to his company's trucks. This takes his men off their regular running maintenance work or major overhauls. He rants at the carelessness of the drivers or makes sarcastic remarks about the training or the supervising of the operating department.

However, he does the work, the cost of which is included in the expense of his department. Many maintenance superintendents have found their complaints almost as useless as pumping out the ocean, until they segregated such accident-repair costs and brought them out into the open where their total amounts could be seen. Now they can be compared month by month or year by year and something can be done about them.

The cost form shown below indicates how this can be done by adding a line, "Cost Repairs Due to Accidents." H. E. Hildebrand, director of engineering, Bakeries Service Corp., New York City, which maintains the trucks of the Continental Baking Co., follows such a plan with beneficial results.

TRUCK NO. _____ MAKE _____
ENGINE NO _____
DATE PURCHASED _____

TRUCK OPERATING COST RECORD

		Year Total	January	February
1	Gasoline	2671 0		
2	Oil	42 00		
3	Tires	47 43		
4	OPERATING CHARGES	3563 3		
5	Chassis repairs, less accidents	1683 3		
6	Body repairs, less accidents	65 82		WHY ?
7	Chassis and body repairs due to accidents	3078 1	2876	
8	Service labor	1052 2		
9	Supplies and miscellaneous	50 84		
10	MAINTENANCE CHARGES	6980 2		
11	Depreciation, chassis	9008 2		
12	Depreciation, body	2770 4		
15	FIXED CHARGES	1312 5 2		
16	TOTAL EXPENSE	2367 0 7		

A typical Truck Operating Cost Record showing how the cost of chassis and body repairs due to accident is brought out forcibly by setting that expense apart on a separate line from ordinary or running repairs. In the case cited, the cost of accident repairs is about 44 per cent of total maintenance.

Clinics Help to Reduce Truck Brake Expenses

INCREASED truck speeds and increased gross weights through better axle load distribution have placed such additional burdens on modern truck braking systems that many maintenance superintendents in the food field have been forced to change their brake maintenance policy materially and improve, through training, the skill of their brake personnel. This applies to general brake adjustment of different brake types, drums and brake linings.

The manufacturers of brakes, drums and linings were quick to take cognizance of the changed conditions indicated by reports of unsatisfactory performances of their products, and many such concerns now offer a complete engineering brake service which fleet operators in the food field may utilize to reduce their brake maintenance costs.

Among the companies reporting to FOOD INDUSTRIES as rendering such services are the Wagner Electric Corp., manufacturer of Lockheed hydraulic brakes, and the Multibestos Co., manufacturer of the brake lining of the same name. The Timken-Detroit Axle Co., Detroit, Mich., while not conducting any brake clinics of its own, has participated in several held by the Bendix and Westinghouse companies.

The Wagner company holds clinics in the major cities of the country. Recent clinics were held in Detroit and Kansas City and those in Chicago and Pittsburgh had attendances respectively of 400 and 300 persons. Free training is given to fleet-owner brake mechanics in the Wagner branch service stations. Special problems are solved with the help of the factory service experimental department. Information regarding the Wagner Lockheed service and the dates of the 1933 fall clinics may be had by addressing the Technical Service Dept., Wagner Electric Corp., 6400 Plymouth Avenue, St. Louis, Mo.

The Multibestos Co., Cambridge, Mass., for the past 2½ years has conducted the Multibestos Brake Service Institute, which operates a crew of traveling brake experts with trucks operating out of Boston, New York, Philadelphia, Chicago and San Francisco. A special technical brake engineer also is available for the solution of problems in heavy-duty service.

Coasting Trucks Down Hill Is Dangerous and Increases Repair Costs

WHILE the coasting of trucks to stops on level roads saves brakes and tires, the practice of coasting down hills is both dangerous and expensive. Such coasting may be done in one of two ways: by throwing out the clutch and leaving the gearset gears in mesh; or by leaving the clutch engaged and throwing the gearset in neutral.

No matter which way it is done, the practice is dangerous because of the likelihood of the truck getting out of control should a sudden stop be required. It is also hard on the brakes, as no retarding force can be supplied by the engine compression.

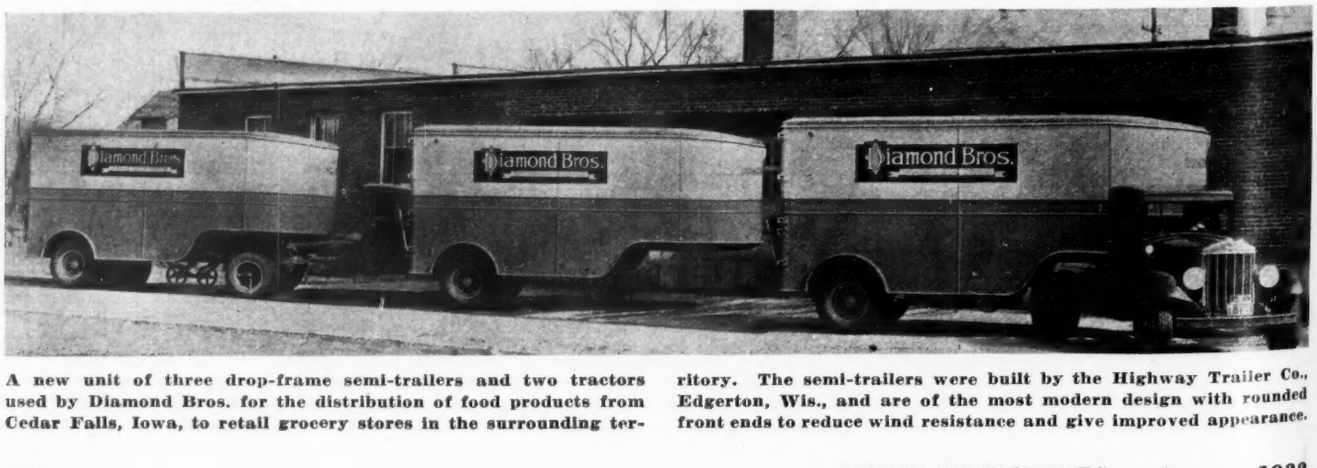
When a truck coasts down a hill, it is driven by its rear wheels instead of its engine. Unless the speed of the engine is, by skilful operation on the part of the driver, synchronized with the speed of the propelling members between the rear wheels and the clutch or gearset, sudden shocks are transmitted to these members when the power connection is again made. These shocks may result in broken universal joints or axle bearings; bent propellor shafts or broken crankshafts. All these increase the cost.

Thus, to keep the truck under better control while going down hills, as a safety measure and to reduce the possibility of increased repairs, the truck should be always left in gear and its speed regulated by the application of the brakes to that speed at which it runs on the level in the same gear.

Robin's Trailer Chart

Philip T. Robin, engineer, trailer division of the Wellman Engineering Co., 7000 Central Avenue, Cleveland, Ohio, has developed a copyrighted chart showing the correlation of tractor and trailer net gross weights and tire sizes. The chart consists of eight separate curves to give individually other factors of trailer chassis weights, dollies and rear axle units, body allowances, etc.

The data indicated is based on the concept that the capacity ratings of trucks and trailers may be definitely associated and that the trailer payload may be readily established by the sum of its tire ratings as specified by the Tire & Rim Association.



A new unit of three drop-frame semi-trailers and two tractors used by Diamond Bros. for the distribution of food products from Cedar Falls, Iowa, to retail grocery stores in the surrounding territory. The semi-trailers were built by the Highway Trailer Co., Edgerton, Wis., and are of the most modern design with rounded front ends to reduce wind resistance and give improved appearance.

NEW BOOKS

MODERN INDUSTRIAL ORGANIZATION. By Herbert von Beckerath. Translated by Robinson Newcomb and Franziska Krebs. Published by McGraw-Hill Book Co., Inc., 330 West 42d St., New York, N. Y., 1933. 385 pp., 6¼x9¼; cloth. Price, $4.

CHANGES in the conceptions of industrial economics require constant attention by industrial leaders to literature on the subject. Of unusual interest is this uncommon type of book in economic literature; partly because of its great scope and partly because of its international outlook. Not only does it review the differences among nations in the historical development of industry; it relates private property and socialism to economics and to society and culture as well. It surveys the machine age, mass production and advertising. Finally, it considers the future of industry in Germany, England, France, Italy and the United States, with a word on the prospect of the evolution of private industrialism to socialism.

MARKETING AGRICULTURAL PRODUCTS. By F. E. Clark and L.D.H. Weld. Published by Macmillan Co., 60 Fifth Ave., New York, N. Y., 1932. 672 pp., 6x8¾; cloth. Price, $4.25.

AS processing and packing of farm products is a step in the journey, the book deals with such subjects as warehousing and cold storage, the handling of perishable freight, the advertising of foodstuffs, federal standards for farm products, packaging, wholesale auctions of fruits and vegetables, and specialized production. Besides the fundamentals of marketing, the developments in the field since 1915 are covered.

ANNUAL REVIEW OF BIOCHEMISTRY. Edited by J. M. Luck. Published by Stanford University Press, Stanford University, Calif., 1933. 564 pp., 6½x9; cloth. Price, $5.

THIS second volume of helpful summaries of studies in the field of biochemistry includes surveys of 25 distinct aspects. Nearly 3,000 papers were reviewed. Much of the material deals with metabolism and nutrition, of interest to research workers in the food field. On the subject of vitamins alone more than 300 separate papers are cited as having been reviewed. The reviewers are outstanding authorities on their subjects from both the United States and foreign countries.

A TREATISE ON CAKE MAKING. Published by Standard Brands, Inc., 595 Madison Ave., New York, N. Y., 1933. 375 pp., 7½x10¼; cloth. Price, $1.

THE expressed purpose of the publisher is "to assist the baker in gaining the cake business which should rightly be his." To attain this aim the authors have divided the subject into four parts, all of which bear directly on the field of commercial cake baking. Part I deals with present-day conditions and explains the means by which the baker may increase his market; Part II discusses basic ingredients; Part III outlines cake-making processes; and Part IV includes cake and icing formulas and directions for handling them.

NEIGHBORHOOD DISTRIBUTION AND CONSUMPTION OF MEAT IN PITTSBURGH. By John H. Cover. Published by University of Chicago Press, Chicago, Ill., 1932. 228 pp., 6x9; cloth. Price, $2.50.

CONSTRUCTIVE indications as to what consumers prefer in the meat products line and what methods of purchasing they employ are pointed out in the study of neighborhoods of different kinds in Pittsburgh. Such a survey of typical neighborhood life in one large city is valuable to the meat packer and processor in that it shows what factors determine purchasing in the large centers of meat consumption. Buying, the study points out, is influenced by a number of social and economic phenomena, such as family income, composition of family, occupation, housekeeping methods and shopping methods.

CUSTOMER TURNOVER EXPERIENCE OF MEAT PACKING COMPANIES. By Howard C. Greer, professor of accounting, University of Chicago. Published by School of Business of the University of Chicago, May, 1933. 34 pp., 6x9; paper. Price. 50c.

THIS accountant's study of customer experience of three branch houses of packing companies in the period between 1926 and 1930 covers a total sales volume of $15,000,000. It brings to light an amazing customer turnover and shows that the biggest cause of lost customers is the customer's own lack of business success. It points out that the small new customer who later grows to be a large customer is a commercial myth. The first month's experience is an index to all future purchases. Selective marketing appears to be the answer to most of the problems of customer turnover. The book is worth reading regardless of the line of business in which one is engaged.

THE ENGINEERING ASPECTS OF THE CONDENSING AND DRYING OF MILK. By A. W. Scott. Published as Bulletin No. 4, by the Hannah Dairy Research Institute, Kirkhill, Ayrshire, Scotland, 1932. 120 pp., 6⅛x9¾; paper. Price, 4s. 6d.

ECONOMICAL removal of water from raw milk is the principal concern of the companion piece to Bulletin No. 3 on the properties of milk, reviewed also in this issue. The discussion of the process of drying or condensing furnishes data valuable to food manufacturers on heat transfer and evaporation. Vacuum pan evaporation, film and spray drying, and the performance of typical plants involve an abundance of problems for the food engineer.

THE VITAMINS IN HEALTH AND DISEASE. By Barnett Sure. Published by Williams & Wilkins Co., Baltimore, Md., 1933. 206 pp., 5¾x8¼; cloth. Price, $2.

NEARLY everyone, foor manufacturer and consumer alike, speaks glibly of the vitamins without always knowing what these activators are or do. A partial explanation lies in the difficulty with which lay readers have been able to obtain simply expressed and understandable information on their occurrence, function, isolation and identification. The author's summation of this knowledge provides a tool for further research as well as a means for general readers to familiarize themselves with these much publicized food accessories.

THE PROPERTIES OF MILK IN RELATION TO THE CONDENSING AND DRYING OF WHOLE MILK, SEPARATED MILK AND WHEY. By L. A. Allen. Published as Bulletin No. 3 by the Hannah Dairy Research Institute, Kirkhill, Ayrshire, Scotland, 1932. 159 pp., 6⅛x9⅝; paper. Price, 4s. 6d.

ALTHOUGH the general principles of condensing and drying usually are fairly clear, the technical difficulties in applying them to condensed and dried milks are often numerous. The manufacture of these products requires the utmost care, and presupposes a thorough knowledge of the properties of milk. Dr. Allen explains not only the properties of milk but also the technical problems of manufacture. Of chief value to the food engineer are sections describing the common defects of manufacturing and the methods of eliminating them.

ABSTRACTS OF
Current Literature

FERMENTING CARBOHYDRATES. Efisio Mameli and Antonio Mossini. *Giornale di chimica industriale ed applicata,* Vol. 15, pp. 161-167; April, 1933.

In the fermentation of sugars or starches unsaturated organic compounds have the peculiar property of accelerating the fermentation process; the greater the chemical unsaturation the greater the accelerating effect. Some of them are so potent that 1 part in 20,000 gives a noticeable increase in fermentation rate. Most of them reach their maximum activity at about 1 part in 1,000 to 10,000. With many 1 part in 100 is a large overdose. Among the potent are a number of coal-tar derivatives such as: anthracene, indene, phenanthrene and acenaphthene. The most interesting group is that including cholesterol and ergosterol. Just as ergosterol is activated, as a vitamin factor in foods, by irradiation with ultra-violet rays, so both cholesterol and ergosterol are enormously activated, in their power as fermentation accelerators, by irradation. Untreated ergosterol gave an increase of 11.1 per cent in the fermentation rate of a sugar mash; after irradiation the increase was 57.2 per cent.

STERILIZING AND BLEACHING THE WHOLE GRAIN. H. Simons. *Muhlenlab.,* Vol. 3, pp. 25-28; 1933. [From *British Chemical Abstracts,* B, Vol. 52, p. 408; May 19, 1933.]

Grain may be bleached and sterilized by sulphur dioxide or sodium bisulphite (Geka process, German Pat. 126, 202). A description and diagram of the apparatus are given. The excess of bleaching agent may be removed by aeration or by use of ammonium persulphate.

DETECTION AND DETERMINATION OF PEANUT OIL IN SESAME OIL. G. Benz. *Zeitschrift für Untersuchung der Lebensmittel,* Vol. 64, pp. 686-491.

The use of various mixtures of vegetable oils calls for a method for detecting and determining the components of such mixtures. Qualitative tests on various mixtures and samples of peanut and sesame oils are studied. The test of Franz-Adler as modified by H. Luers *(Zeitschrift für Untersuchung der Lebensmittel,* Vol. 24, pp. 684) has been found most satisfactory and improved upon. Several quantitative methods, based on determining arachidic acid, are investigated and certain precautions recommended.

MAIZE STARCH. A. E. Williams. *Industrial Chemist,* Vol. 9, pp. 129-133; April, 1933.

Production of maize starch is discussed under the headings of: manufacturing methods; separation of the maize germ; elimination of husk; removal of gluten; draining the starch; "crusting" process; drying, sifting and dressing; and maize oil. What is said to be an important cause of deterioration of starch is hydrolytic action of hydrochloric acid, remaining after the manufacturing process. Such action may be effectively prevented in most instances by maintaining a slight alkilinity in the starch.

RUSSIAN CANNING ACTIVITIES. D. Barr. *Food,* Vol. 2, p. 249; May, 1933.

The Soviet Canning Trust increased its production from 206,000,000 cans in 1929 to 714,000,000 cans in 1932. Production of canned goods for 1932, in millions of cans, was as follows: pork and beans, 25; vegetables, 74; meats, 92; tomatoes, 100; fish, 173; fruits, 271.

VITAMIN D. O. F. F. Nicola. *Giornale di chimica industrale ed applicata,* Vol. 15, p. 135; March, 1933.

An experimental study has been made of the preparation of vitamin D by irradiation of ergosterol with ultra-violet light, with a view to ascertaining the most effective wave lengths of light and the most favorable conditions. The irradiation of ergosterol produces at least one compound, perhaps more, without anti-rachitic value. If the irradiation is carried too far, the vitamin D which is formed is destroyed, probably by formation of an iso-ergosterol. Degradation products of vitamin D, made by overexposure, do not have characteristic selective absorption spectra by which they can be identified; but vitamin D and the irradiation product which is not anti-rachitic show characteristic absorption bands. It is the longer wave lengths in the ultra-violet light which favor the conversion of ergosterol to vitamin D; the shorter wave lengths are ineffective. The preferred solvent for rapid conversions is a mixture of alcohol and ether; solutions in lecithin, cholesterol, and in cholesterol esters also were tried.

CANDIED ORANGE AND LEMON PEEL. M. C. Campbell. *Food,* Vol. 2, pp. 257-259; May, 1933.

Detailed descriptions are given under the headings of selection of raw materials, boiling of skins, syruping, drying and candying. A simple physical test is used in the candying operation to ascertain the correct strength of syrup. The test consists of dipping a skimming plate (a circular copper plate perforated with ¼-in. holes) into the syrup, and then blowing against it. If the syrup is of correct strength, a bubble is reasonably easily formed at the hole on the opposite side of the plate. The candied peel should be packed immediately, as moisture soon renders the candy sugar soft.

ANTI-RACHITIC ACTIVATION OF MILK BY DIRECT IRRADIATION WITH ULTRA-VIOLET RAYS. G. C. Supplee. *American Journal of Public Health,* Vol. 23, pp. 225-229; March, 1933.

Clinical and laboratory experiences have proved the value of irradiated milk. A successful commercial method for irradiation of milk has been developed. The cycle of exposure at close range is approximately 0.3 second; the thickness of film, 0.4 millimeter; the total time of exposure does not exceed 16 seconds. Carbon arcs of the flaming arc type are used. One unit treats 5,000 pt. of milk per hour. Substantially the entire degree of anti-rachitic potency which can be imparted to milk is produced almost instantly, or within a very few seconds, and destruction of vitamin A is insignificant or even immeasurable. The additional cost is only about $\frac{1}{25}$ cent per quart.

A NEW METHOD FOR PRESERVATION OF FOODSTUFFS. J. Sevon. *Teknillenen Aikakanslehte,* Vol. 23, pp. 1-7; 1933. [From *Chemical Abstracts,* Vol. 27, p. 1410; March 20, 1933.]

Hydrochloric acid has a preservative action on foodstuffs, but it attacks colloidal organic matter even in low concentrations. This effect can be eliminated by the use of hydrochloric acid-sodium chloride mixtures in proportions determined by experiment for each foodstuff. Temperature, air, light and desired preserving time are necessary considerations. In general the pH is about 4 to 5. Fermentation processes, such as pickled cucumbers and fermented cabbage, can be stopped or shifted in any desired direction by the addition of proper proportions of this preservative mixture.

NEW PRODUCTS—

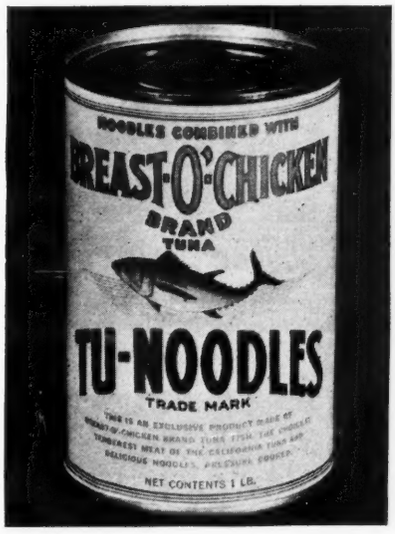
—NEW METHODS

Lithographed Display Window

Canned goods look like fresh goods under glass when labeled with the "Appetite-Appeal Display Band" designed by Sprague, Warner & Co., Chicago, Ill. The lithographed paper band pastes over the brand label, and gives the appearance of a window in the can. A merchandising booklet by Sprague, Warner describes the new display band and points out that display stocks of canned foods should be "broken" to give the impresion that customers have been buying from the stock.

Honey and Apricot Butter

Honey and apricots have been combined in a tempting spread, "Western Clover," for sandwiches, rolls and muffins by National Sales Agency, Washington, D. C., manufacturer. The apricots are reduced to a butter, and the honey added as sweetening. The spread is packaged in 12-oz. glass jars wrapped in yellow-tinted transparent cellulose.



Tuna-Noodles Combination

Among recent innovations on the canned foods market is the combination of tuna fish and noodles called "Tu-Noodles," packed by Westgate Sea Products Co., Inc., San Diego, Calif. The product contains Breast-O'-Chicken brand tuna and noodles, and is packed in a 1-lb. can.

Vegetable Health Bread

Desiccated celery, spinach and carrots are three ingredients added to the usual ones in the preparation of flour for health bread, a product of Sunny Foods Co., Philadelphia, Pa. The flour is put through a malting proces which converts the majority of starch into maltose. The vegetables are desiccated mechanically without heat application, so that they retain their mineral salts, vitamins and enzymes. The loaf, made from prepared flour requiring merely the addition of water and yeast, is baked at 300 to 325 deg. F. The bread is said to remain fresh for from seven to ten days.

Packs Cheese in Tumbler

Packing creamed cottage cheese in thin-blown glass by Sheffield Farms Co., New York, N. Y., provides a commodity in a container of practical re-use value. The glass package is an 8-oz. "Safedge" water tumbler, suitable for table use, made by Libby Glass Manufacturing Co., Toledo, Ohio. It is sealed with a cap of light-weight aluminum foil, rolled over the bead at the top edge of the tumbler. The cap is stamped with the product label.

Onion Soup

Canned onion soup with a Continental flavor has been introduced in several test markets by George A. Hormel & Co., Austin, Minn. The soup is prepared in French style, consisting of a pint of beef soup stock with onions that are shredded and fried in butter. To introduce the new soup, a free-trial can is packed in a carton with three cans of vegetable soup. The introductory package is designed in the manner of the French tricolor with red, white and blue bands.

The new soup will soon be available in grocery stores throughout the United States, and it is believed that this will be the first time onion soup has had national distribution.

Moist Citron and Fruit Peels

Makers of fruit cakes, mincemeat, coffee rings and other bakery products are offered a new type of preserved citron and fruit peels by Hills Brothers Co., New York, N. Y. The peels are prepared by a process said to retain the natural color, tenderness and flavor without the use of preservatives or artificial colorings or flavors. They do not require soaking and do not absorb moisture from the baked product. Packed in No. 5 cans, they have been nationally marketed.

Another Salad Dressing

"Double your money back" is the guarantee of Kraft-Phenix Cheese Corp., Chicago, Ill., if you do not like its new "Miracle Whip" salad dressing. It is meant to satisfy the demand for a dressing combining the qualities of mayonnaise and old-fashioned boiled dressing. It includes salad oil, eggs and other proved ingredients, all whipped together in a special machine.

Large Tight-Wrapped Carton

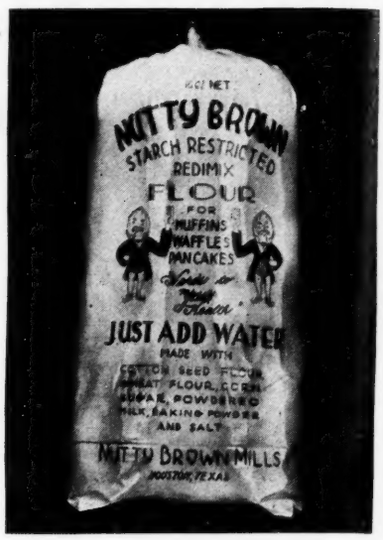
Something like a record for the size of a tight-wrapped package was set when Albers Bros. Milling Co., Portland, Ore., put its Carnation Flaked Wheat on the market in 3 lb. 7 oz. tight-wrapped cartons. The package measures 11x7½x4½ in. and it is tight-wrapped at the rate of 35 to 40 a minute. The package is tightly sealed, nonsifting and weevil-proof, and identical in appearance with the smaller Flaked Wheat packages. This packaging problem was worked out in cooperation with Stokes & Smith Co.

Bottles Pure Lemon Juice

Lemon juice bottled without adulterants, preservatives or sugar by Lemon-Juice, Inc., Oakland, Calif., is now available from retailers. The product, called LemonJuice is the juice of lemons ripened on the tree, and "nothing is added or taken away." Ordinarily, bottled lemon juice loses its flavor in a rather short time, but the new product is said by chemists to retain its flavor, both while bottled and after being opened, without showing material quality depreciation.

Fruits in Sulphurous Acid

With the idea of escaping the high tariffs on canned goods, Fruit Products Laboratory of the University of California, Berkeley, Calif., and the State Bureau of Commerce have been experimenting with a new method of shipping fruit. The packing process is, in brief: wash firm fruit just picked and put it into kegs; fill the keg with sulphurous acid of desired strength, and close the keg; just before shipment, make up the absorbed and evaporated sulphurous acid solution; close and seal the keg with paraffin. With this method peaches, apricots, figs and prunes have been shipped to Germany and apricots and figs to England. The fruit arrived in good condition, and was used satisfactorily in making jams, butters and preserves.



Cottonseed Muffins, Waffles

"Just add water," says the printed matter on the package of Nutty Brown "Redimix" flour recently developed by Nutty Brown Mills, Houston, Texas. The ready-mixed flour contains special cottonseed flour, wheat flour, corn sugar, powdered milk, baking powder and salt. It has a higher percentage of protein than ordinary flour and a lower proportion of starch. By the addition of water to the flour, muffins, waffles and pancakes can be made, using standard recipes. The package is a transparent cellulose bag.

Packs Fresh Asparagus

Fresh bunched asparagus in packages is now being marketed by the Starkey Farms Co., Morrisville, Pa., growers. The bunches are placed in cartons with show windows of transparent cellulose. These cartons are cased in dozens. Both cartons and cases were designed by Robert Gair Co., Inc., New York, N. Y.

Powdered Ice Cream

Developed to satisfy the housewife's desire for a simple means of making refrigerator ice cream, the "Ready-mix" ice cream powder manufactured by Joseph Burnett Co., Boston, Mass., contains no gum, starch or gelatine. Milk and cream are added to the contents of one package to make a quart of vanilla or chocolate ice cream either by hand or mechanical freezing. Both flavors contain Burnett's vanilla extract.

The mix has been marketed in New England, and is expected to reach national distribution as soon as production permits.

Rippled Wheat for Breakfast

As there is considerable waste from partially eaten portions of breakfast food, Loose-Wiles Biscuit Co., Kansas City, Mo., has produced a smaller than normal breakfast biscuit called "Rippled Wheat." It is made of whole wheat, including all the bran. It is packed in a large upright carton containing 28 small, square biscuits and a small restaurant-size carton holding four biscuits. The product has been marketed in New England, New Jersey, New York and the Philadelphia district.

Vacuum Packed Spices

In order to preserve fully the aroma and flavor of freshly ground spices, Hanley & Kinsella Coffee & Spice Co., St. Louis, Mo., now is marketing vacuum-packed condiments. The containers are of transparent crystal glass of modernistic design, and have capacities from one to two ounces. The molded caps, which are dome-shaped and of different colors, serve as shaker tops and as measures, the interiors being graduated in full and fractional teaspoonfuls. An inner disk provides the vacuum seal. The package is a product of Owens-Illinois Glass Co.

Milk Dehydrated by Freezing

Concentrated milk has recently been marketed by Supreme Dairy Farm, Pasadena, Calif., at approximately the price of certified milk. It is asserted that it contains twice the food value of an equal quantity of milk and contains 50 per cent less water. The machine used for partially dehydrating the milk is a large refrigerated drum of stainless steel, revolving in an airtight insulated chamber. Brine at 28 to 32 deg. F. is used in the cooling process. As the drum revolves, it contacts the milk introduced into a tray by continuous flow. Congealed to the consistency of slush, the milk adheres to the drum and is carried to a point where a steel brush sweeps it into a conveyor below. It is carried to a centrifuge, where the unfrozen portion is whirled through a revolving perforated basket which retains the water crystals. Experimenters with the process maintain that only 0.6 per cent of solids is lost in the ice.

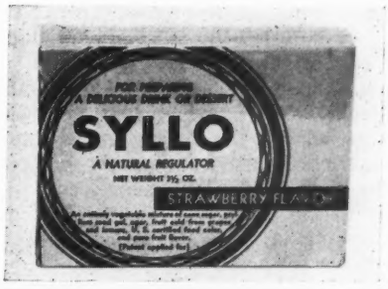
Malted Milks Complete

Egg malted milks at home without the use of ice cream or fresh eggs are possible with Micky Malto powder, manufactured by Micky Malto Products Co., San Francisco, Calif. It is a combination of dried whole milk, dried whole eggs, barley malt, soluble parts of wheat elements and vanilla flavoring.

The powder is packed in tins of various sizes. Continental Can Co., Inc., developed the containers.

Package Increases Sales

A new package and a new brand name united in acquiring for Dixieland Products Co., Columbus, Ga., a sales volume of $40,000 a month in less than six months for its product, "Dixieland" peanut butter. Originally manufactured by Tom Huston Peanut Co., Columbus, Ga., the peanut butter was placed in a new division, and, through research, was improved. It was packed in glass jars designed by Owens-Illinois Glass Co., and capped by Closure Service Co.



Like Gelatin, But Is Not

Vegetable ingredients furnish psyllium gel in a different form in "Syllo," developed by Pacini Laboratories and distributed by Emery Food Co., both of Chicago, Ill. The product, which resembles gelatin dessert, consists of cane sugar, psyllium seed gel, agar, fruit acid from grapes and lemons, certified fruit colors and fruit flavor. It may be used in making fruit drinks, desserts and salads. One of its merits is that it sets in 45 minutes and will not soften in hot weather.

Garlic Without Odor

Garlic odor has been effectively exterminated. By producing the garlic in liquid form, Allium Co., New York, N. Y., has removed all traces of the virile odor of the garlic bulb. The product is free from artificial preservatives and is colorless. Packaged in a sprinkler-top bottle, ½ oz. of the liquid garlic will flavor as much food as a pound of the natural bulb.

What Food Men Are Doing

Bakers Boost Prices in Many Cities And Administration Will Investigate

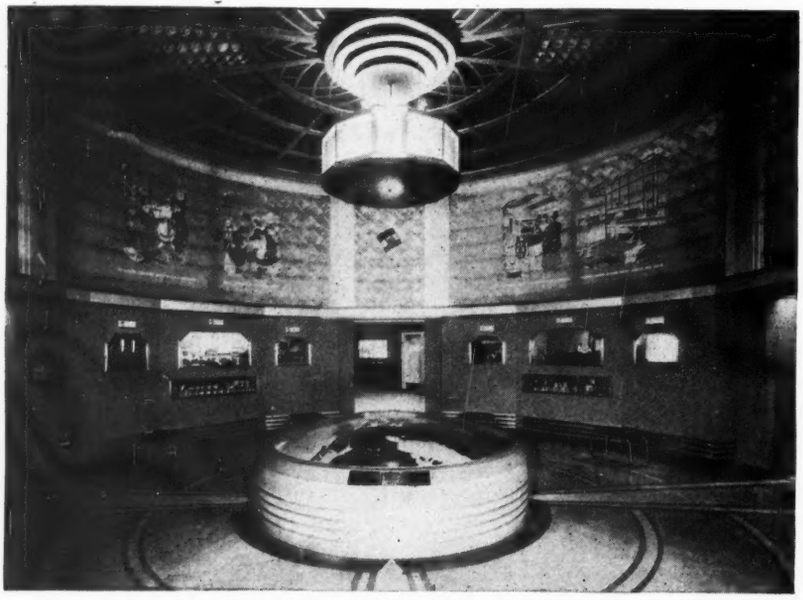
Bakers of the "staff of life" have been the first industrialists to feel the keen edge of the administration's determination to prevent profiteering. And climaxing several charges that rises in bread prices have been too high is an announcement that price increases in 39 cities of 21 states will be investigated.

This development succeeds a controversy between Secretary Wallace and Henry Stude, president of American Bakers' Association. Although A. A. A. closed the controversy by publishing Mr. Stude's report defending the "profiteering" cases listed by Secretary Wallace, the complainants apparently are not yet satisfied that "gouging" is not being practiced. Mr. Stude's report showed in the main that the 3-cent price boosts were accompanied by increases to 16 oz. from 12 oz. in the loaf size.

With the imposition on July 9 of the processing tax of 30 cents on wheat, a price rise for bread was expected. However, according to Secretary Wallace, the processing tax does not justify more than a half-cent rise for the pound loaf. The increase in the price of wheat and the processing tax together would not occasion a boost of more than 1⅓ cents in the price of the 1-lb. loaf, Secretary Wallace told the Iowa Bakers' Association in a letter of July 1.

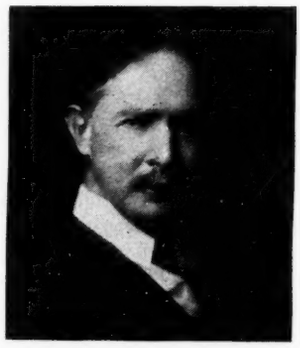
Proposed price rises in many cases have been well within the estimate by the Secretary as a fair increase, although in others they have been larger. In Baltimore, a rise in price of 1 cent per pound loaf has been the rule, while in New York the same increase has been approved. In Milwaukee, the price rise likely will be 1 cent on the 1½-lb. loaf, and in Philadelphia a general increase of 1 cent per pound loaf has been observed. In Birmingham, bread has risen from 6 to 10 cents, and the size of the loaf has been increased.

Bakers in many cities have been loath to increase prices until they can determine the increase in cost.



Fair View of Standard Brands

Located in the circular "building-within-a-building," a revolving map of the United States tells World's Fair visitors of the extensive coverage of the Standard Brands, Inc., delivery system. Dioramas, murals and sample products complete the company's attractive display in the Agricultural Building.



Lucius R. Eastman

Recently appointed by Administrator Johnson to the Consumers' Advisory Board with Prof. Alonzo E. Taylor, director of the Food Research Institute of Stanford University, Mr. Eastman is president of Hills Bros. Co., New York, and American representative on the economics committee of the League of Nations.

Many Codes Take Shape In Food Industries

Food manufacturers and distributors are making considerable headway in the preparation of codes under A.A.A. Some of these codes have reached more or less final stages, as reported elsewhere in this issue. Others are rapidly coming into shape.

National Confectioners' Association is making a survey to determine minimum wages and maximum hours for a final code. G. H. Williamson, president of the organization is strongly urging the cooperation of everyone in the industry. International Association of Ice Cream Manufacturers has a tentative code ready and has appointed Henry N. Woolman, Supplee-Wills-Jones Milk Co., Philadelphia, as contact man with Washington. The brewers got together on the basis for a code at a meeting June 29 and have made much progress toward a final draft. Salmon canners, through the Association of Pacific Fisheries and the Northwest branch of National Canners' Association, have prepared a tentative code. National Preservers' Association has released the preliminary draft of a code to the industry, along with a questionnaire on labor requirements.

A committee has been appointed by Flavoring Extract Manufacturers' Association to collect the data necessary for a code. National Association of Manu-

Malcolm Muir

As deputy administrator under N.R.A., Malcolm Muir, president of McGraw-Hill Publishing Co., Inc., is concerned with the agreements of certain industry groups.

facturers of Fruit and Flavoring Syrups has been increasing its representation in the industry and working toward a code.

Cheese makers, working through National Cheese Association, expected to have a code in Washington by Aug. 1. Butter manufacturers disagreed on a code drawn up by American Association of Creamery Butter Manufacturers, but the differences will be ironed out in Washington.

Limits on Wages and Hours Set in Food Codes

Labor provisions seem to be the stumbling block in many of the trade practice codes. And yet, they are the most important part of the code from the Administration's point of view. Practically all of the food industry associations have made, or are making, surveys of their industries to determine the best combination of minimum wages and maximum hours, and some have worked definite schedules into their tentative codes.

Under the proposed code of Associated Coffee Industries of America, no male employee will be paid less than $15 per 40-hour week and no female less than $12 per 40-hour week. However, such a scale will not apply to apprentice employees. The schedule of working hours provides that no employee shall work more than an average of 40 hours per week in any one month.

A graduated scale of minimum wages has been incorporated into the labor section of the American Spice Trade Association code. The schedule of minimum wages for male labor calls for 60 cents an hour for skilled labor, 50 cents for semi-skilled, 40 cents for unskilled and 30 cents for apprentice help. Female workers will be paid at a rate of 30 cents an hour. Minimum wages for overtime are to be 25 per cent higher than the regular rates. The labor section also includes the provision that no minor labor under 16 years of age shall be hired.

In keeping with the recent agreement of the California canners, the peach growers on the Pacific Coast will pay a minimum wage of 27½ cents an hour, a considerable increase over last year.

Dairies Will Be Licensed

To compel conformance to market agreements by all members of the dairy industry, Secretary Wallace will issue licenses to all wholesale and retail processors and distributors of milk in those sections covered in marketing agreements. The authority for such action is contained in the licensing powers of A.A.A. Violators of marketing agreements in their sections may be fined as much as $1,000 a day.

Hearings on milk agreements proposed for the cities of Atlanta, Baltimore, Detroit, Evansville (Ind), Los Angeles, Oakland (Calif.), and San Francisco have already been held by the Department of Agriculture and A.A.A.

Coulter Drafts Agreement For Sugar Industry

A tentative plan for regulating the sugar industry has been submitted to Secretary Wallace. The plan provides for the establishment of a stabilization committee, fixes quotas, and licenses domestic refiners. It was drawn up by Dr. John Lee Coulter, a member of the Tariff Commission, and a committee representing most of the sources of the American sugar supply.

Raw sugar quotas are established by the plan. Hawaii is allotted 975,000 tons; Virgin Islands, 9,080 tons; Philippine Islands, 955,920 tons; Puerto Rico, 875,000 tons; Cuba, 1,700,000 tons; Louisiana (cane), 250,000 tons; Florida (cane), 60,000 tons; United States beet sugar areas, 1,525,000 tons.

Imports of refined sugar from sources outside the continental United States would be limited to the following maximum shipments: Hawaii, 30,000 tons; Puerto Rico, 100,000 tons; Virgin Islands, none; Philippine Islands, 56,000 tons; Cuba, 110,000 tons. In these estimates each 107 lb. of raw sugar would be considered equal to 100 lb. of refined sugar.

Under the proposed plan Louisiana would be limited to 6,000,000 gal. of commercial syrups, of which 4,000,000 gal. would be first molasses, and 2,000,000 gal. second molasses. No limitation is placed on these products from Florida.

Proposals by the Cuban interests to increase the tariff preferential from 20 to 50 per cent were vigorously opposed by the domestic sugar producers. The Cubans asked a reduction of the tariff from 2 cents to 1 cent per pound.

Secretary Wallace has the power to change the provisions of the tentative plan if he sees fit and then to order it into effect. The agreement would be in effect for three years, beginning July 1, and it would be renewable from year to year.

The announcement of the sugar agreement has aroused great protest from domestic beet sugar producers. And it has been attacked by Thomas L. Chadbourne, negotiator of the International Sugar Agreement. Mr. Chadbourne believes that the agreement approaches the problem not from the production angle, the correct one, but from the marketing angle.

Hors d'Oeuvres

TWO EVENTS of prime importance to Il Duce's countrymen occurred during July—Balbo's flight and the introduction of odorless liquid garlic. And the genius that brought these together by giving good-luck packages of the garlic to the Italian airmen got his product more free publicity than the company could buy with a year's income.

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THE KENTUCKY Court of Appeals has decided that beer is a soft drink and cannot be taxed as a fermented malt beverage. Well, anyone who has tickled his tonsils with the famous "Kentucky Corn" will readily appreciate the blue-grass country's attitude.

•

MIAMI has a five-cent bottle of beer —"Burp." Excuse us, but that's the name of the beverage. The idea seems to be that you automatically repeat the name after consuming the product.

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VITAMIN D has been incorporated in wieners and little pig sausages by a Columbus firm. Even a hog can't be natural in these highly scientific times.

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GROCERS are planning beverage departments for beer, wine, ginger ale and other beverages. The druggists better beware. The grocers will take away some of their food and beverage business.

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IN AUSTRIA, meat is not merely a food—it is a weapon. On July 11, Austrian Nazis were directed to become vegetarians so as to ruin the peasants who would blame Premier Dollfuss and throw him out.

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PEERLESS MOTOR CAR CORP. has taken over a brewery. Perhaps they'll adopt the slogan, "When better beer is brewed, Peerless will brew it."

•

TABLETS with such a concentrated food value that two are equivalent to three meals have been prepared from cottonseed by a German chemist. Imagine what an overdose of those would do to a person's avoirdupois.

George H. Williamson

President of the National Confectioners' Association, states: "The most important job before every man today is to get into line and keep step with the industry."

Mayonnaise Code Standardizes Salad Dressing, Packages

Mayonnaise and salad dressing manufacturers representing 85 per cent of the country's production gathered in Chicago on July 6 at a meeting sponsored by the Mayonnaise Institute to discuss a code of fair competition. One of the principal decisions of the meeting was that all mayonnaise and salad dressing manufacturers must become members of the Mayonnaise Institute.

To enforce the code, a national executive committee, and an executive committee for each of the four new divisions—Eastern, Southern, Central and Western—will be elected.

The proposed code standardizes salad dressing for the first time and amends the mayonnaise standard. Salad dressing would have to contain not less than 25 per cent by weight of vegetable oil, while mayonnaise would have to contain not less than 70 per cent by weight of oil and egg yolk.

Mayonnaise and salad dressing containers specified in the code measure 3 oz., 8 oz., 16 oz., 32 oz., and 1 gal. or whole multiples thereof.

Under the provisions of the code, basic minimum prices to retailers are to be based monthly on fluctuating costs of vegetable oils and eggs and on a delivered basis. Provision, however, will be made in price fixing for sales and other taxes.

A provision eliminating bulk sales of salad dressing has drawn vigorous protest from the Oregon Mayonnaise Manufacturers' Association. An attempt of big business to throttle smaller enterprises is charged.

Texas Bakers Agree on Code

Bakers in south Texas recently agreed on a minimum wage and a maximum number of hours for the labor week in developing their code under the industrial recovery legislation. The code went into effect immediately, providing a minimum of $18 per week as the average rate for unskilled labor. This represents a rise of $3 per week above the previous raise. Skilled labor will be paid a minimum of $25 and $28, according to the particular type of work. The code reduces the hours of labor by about 35 per cent, setting the maximum number of hours at 45 per week.

CONVENTIONS

AUGUST

11—National Malt Products Manufacturers' Association, quarterly meeting. S. L. Goldman, secretary, 160 North LaSalle St., Chicago. (Meeting also in New York City.)

14-16—Bakers' Association of the Carolinas, Charleston, S. C. C. B. Graeber, secretary, 1013 Commercial Bank Bldg., Charlotte, N. C.

21-23—National Food Distributors' Association, Hotel Sherman, Chicago. E. J. Martin, secretary, 110 North Franklin St., Chicago.

SEPTEMBER

2-9—First Beer Exposition; convention of United States Brewers' Association. Col. Jacob Ruppert, president, New York.

18-20—International Association of Ice Cream Manufacturers, 33d annual, Palmer House, Chicago. Robert C. Hibben, Telegraph Bldg., Harrisburg, Pa., executive secretary.

21-23—International Association of Milk Dealers, 26th annual, Palmer House, Chicago. R. H. Little, 228 LaSalle St., Chicago, executive secretary.

23-Oct. 1—Second American Exposition of Brewing Machinery, Materials and Products, Coliseum, Chicago.

24-28—Master Brewers' Association of America, Chicago. W. Eisenbeiss, secretary.

Produces Turbinado Sugar

"Silvercrest" turbinated sugar is Louisiana's reply to the demand for a dry, free-running sugar that is not necessarily snow white. Only one factory in the State produced it during the crop year of 1932, but this year four more factories have been equipped, and it has been predicted that most Louisiana factories will be making the sugar in the next few years.

Production of cane sugar in Louisiana has mounted from 47,000 to more than 200,000 tons in recent years. This is occasioned by the introdiuction of a new cane—a cross between a disease-resistant wild variety of low sugar content and a Javanese cane of high content. With the discovery of a process for making "Silvercrest" sugar like that of Cuba, production is expected to skyrocket much higher.

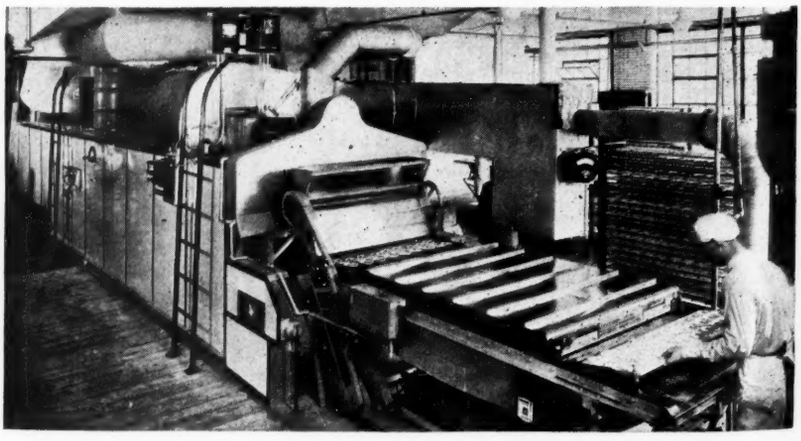
Donald F. Bowey

Chosen to head National Association of Manufacturers of Fruit and Flavoring Syrups at the annual convention in Chicago, Mr. Bowey is leading the organization of the flavoring industry under the recovery legislation. He is vice-president of Bowey's, Inc., Chicago.

Fisheries Protest British Tax

The recent action of the British Parliament in excluding from Great Britain frozen salmon originating in Alaska and the American States along the Pacific Ocean, has aroused a storm of protest in Alaska and among Puget Sound cities. The raise in duty from 1¼ to 3 cents caught several Seattle shippers with several hundred thousand pounds of fish in transit, causing them severe losses.

Under the assumption that Canada, whose salmon was exempted from the duty increase, probably inspired the legislation, West Coast fishing interests declare they will seek retaliatory action at Washington against that country, great quantities of whose fish and fish products are now admitted free to the United States.



435 Pretzels a Minute

With this giant pretzel oven, F. L. Klein Noodle Co., Chicago, Ill., has increased its production of pretzels by 26,250 an hour.

Dairy Industry Demands Acreage Remain Idle

Provisions by the Agricultural Adjustment Administration against the use of abandoned land under the reduced acreage plans has been demanded by a special committee of the dairy industry. The demand means that the 25,000,000 acres previously planted in wheat and cotton which the Department of Agriculture plans to lease from the farmers as part of its reduction programs would not be employed for the production of food or farm crops, and, in brief, would be totally abandoned for all production purposes. The committee, headed by L. J. Taber, master of the National Grange, made its demand in the form of a preliminary report to Administrator Peek.

As the dairy industry is approaching closer to an export basis, the report recommended a thorough study of methods both for controlling production and stimulating consumption. At the same time, the committee urged that the Administration use all its influence to check the importation of vegetable and marine oils and fats. Last year, the report averred, nearly two billion pounds of such products were imported to the disadvantage of home producers of dairy and animal fats and vegetable oils.

More Quick-Freezing Abroad

Increasing production was found to be the rule in quick-freezing plants in England, France and Italy, visited by M. T. Zarotschenzeff, inventor of the "Z" process of quick-freezing and technical director of American Z Corp., New York, N. Y. In England, frozen fish fillets packed in cartons are being distributed by the Grimsby plant to nearly 200 stores for sale throughout the country. In Italy, the fishing company of Umberto Lupi has been subsidized by the government to produce frozen fish sold in the larger Italian cities. In tropical India, Mr. Zarotschenzeff devised a method of preserving milk effectively for several days, during which it was transported 600 miles.

WE DO OUR PART

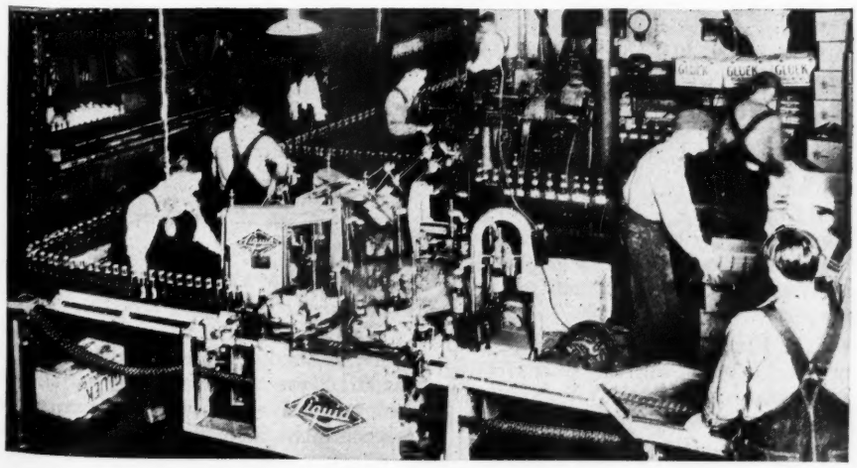
Emergency Badge

Every employer cooperating with the President as a member of N.R.A. will be authorized to show this badge on all equipment, goods, communications and premises. Public opinion is expected to line up all industry.

Canners to Pay Highest Wage

Payment of the highest minimum wage for women that has ever been paid in the canning industry in California, Oregon or Washington was agreed upon early in July. Labor officials of the three states and representatives of the largest fruit and vegetable canners participated in the agreement.

The new wage rate of 27½ cents an hour minimum will be enforced through cooperation of the canners with state labor bodies, which will mean a uniform wage higher than has hitherto been paid to workers, although lower than the California legal standards.



The Final Touch

This new duplex-type rotary labeler at the Gluek Brewing Co., Minneapolis, Minn., handles 130 bottles per minute, or 72,400 in an eight-hour shift.

Dry Defrosting Developed

A process for the defrosting of foodstuffs without the disadvantages resulting from the condensation of water on them has been developed by the Dominion Department of Agriculture and the National Research Council of Canada. Two compartments are employed, the moisture content in both being first equalized by transfer of air from the cold-storage room to the defrosting room. The air flow is then stopped, and the foodstuffs are transferred to the defrosting room, the temperature of which is then raised to normal. Formation of water on the products is thus avoided, the defrosting being done in dry air.

Concentrates

In line with his back-to-the-land movement, President Roosevelt has set up an organization to use $25,000,000 in putting urban unemployed on small farms where they may grow their own food . . . The tolerance for lead residues on fruit has been raised from 0.014 grain to 0.02 grain per pound of fruit for this season's crop . . . As an experiment A. & P. stores in Chicago have been selling Birdseye frozen chicken without installing the special refrigerating cabinets commonly used for frozen foods.

Koshered poultry killed and fully dressed is being shipped from the Middle West to the New York market . . . A new law in Florida requires that packages of eggs be labeled with the class of the product and that advertisements designate whether the eggs are "cold storage," "fresh" or whatever the class may be . . . Milk pumps cannot be used in restaurants, lunch wagons or other eating places in Union City, N. J., since they are held to be unsanitary by the Union City milk inspector.

New York State and Wisconsin courts have ruled that the state milk boards were within their rights in setting minimum prices on milk and in enforcing their regulations by fines . . . Minnesota has passed a 10-cent tax on oleomargarine containing less than 65 per cent of animal fats; edible oil manufacturers are fighting the measure . . . Baltimore has established graduated fees for permits to slaughterers and meat packers.

Steps are being taken in Louisiana to organize a state organization of food packers . . . The recently organized Michigan State Bakers' Association has registered 768 plants as members . . . Canned salmon imported into Australia must be identified according to the species of salmon contained in the can . . . Production of wineries is expected to be doubled by the government ruling that increases quantities obtainable for sacramental purposes from one to two gallons a year.

MEN . . . JOBS . . . AND COMPANIES

Industry

ASSOCIATED BREWERIES, CANADA, LTD., Montreal, will invest about $400,000 in United States breweries, according to E. G. Sick, president. The amount is distributed among six plants, a large portion going into a brewery being constructed in Seattle.

AMERICAN DRIED EGG CORP., Dallas, has established an egg-drying plant with a capacity of 1,000,000 lb. of egg powder annually. The plant is under the management of L. Coquet, who says it is the most complete plant of its kind in the United States.

ARMOUR & Co.'s directors on July 14 approved a plan to create a single class of stock. Stockholders will vote on the plan Aug 22, and a committee has been formed to oppose the step.

BOOTH FISHERIES CORP., a Delaware corporation, has been formed by reorganization of Booth Fisheries Co., it was announced July 17.

EATMOR CHOCOLATE CO., Pittsburgh, has been placed in the hands of temporary receivers. A plan for reorganization is being worked out, it is reported.

ESKIMO PIE CORP. is not entitled to register its trademark "Eskimo Pop," according to a decision by the Patent Office. Clicquot Club Co. opposed registration.

FOODS, INC., is the name of a new company formed by E. E. Taylor, formerly executive vice-president of General Foods Corp., and L. R. Wasey. The new company will take over Bahama Isles Foods Corp. and Smithfield Ham & Products Co., Inc.

LIBBY, MCNEILL & LIBBY will be severed from Swift & Co. as a step in the enforcement of the Packers' Consent Decree. The Department of Justice on July 11 appointed a trustee to take over those shares of the stock owned by Swift.

LIFE SAVERS, INC., subsidiary of Drug, Inc., is expected to be severed from that organization on Aug. 7, when stockholders of Drug, Inc, will meet to decide on dissolution of the $50,000,000 holding company and to reestablish its subsidiaries as independent companies.

MCCORMICK & Co., Baltimore, have opened a branch factory in Canada, and McCormick & Co. (Canada), Ltd., has been formed at Toronto. H. J. McCarney has been appointed manager of the Canadian company.

STANDARD BOTTLING CO., Denver, manufacturer of carbonated beverages and wholesaler of bottled beer, plans to expand its territory to include Wyoming, Nebraska and South Dakota. Walter F. Durocher, general plant manager, states that consumption of soft drinks is on the decline, sales having dropped 50 per cent since the advent of beer.

STANDARD BRANDS, INC., is considering entering the spirituous liquor business through its subsidiary, the Fleischmann Co., providing prohibition repeal is ratified. The company manufactured gin prior to enactment of the Eighteenth Amendment.

SWIFT & Co. has leased the plant of D. C. Herndon & Co., Temple, Texas, with an option to purchase. The plant will be operated as a poultry dressing plant. L. Norris, former assistant at the Enid (Okla.) plant, is manager, and C. Cantroll, Fort Worth, plant superintendent.

UNITED FRUIT CO.'s subsidiary, Food Concentrates, Inc., has acquired the Northjohn process for reducing banana and other hydroscopic fruit products to powder form.

UNITED PACKING CORP. has taken over the plant of the California Cooperative Producers, Oakland, putting it into operation on July 1. The plant has been idle since 1930.

VAN CAMP PRODUCTS' packing and oil companies have been sold. Glidden Co., New York, purchased the plants and inventories of the Van Camp Products Co. and the Van Camp Edible Oil & Soap Co., Louisville, for approximately $200,000. The Louisville interests will be taken over by Durkee Famous Foods Co., Cleveland, a subsidiary of Glidden. Northeast Realty Co., Inc., bought the Van Camp Pompeian Olive Oil Co. at Baltimore for $253,000. Stokey Bros. & Co., Louisville, has acquired operating rights, trade names and inventories of Van Camp Products Co. and all the Indianapolis properties of Van Camp Packing Co., Inc. Van Camp's, Inc., has been formed to operate the Indiana packing plants and business of the Van Camp Packing Co. W. B. Stokely, Louisville, is president; John Stokely, vice-president and treasurer; C. R. Beckert and C. K. Reynolds, New York, vice-presidents; C. C. Culp, Louisville, secretary. Directors of Van Camp Products Co. were charged with mismanagement and illegal practices in a a legal action filed by a stockholder on July 17.

WINDISCH-MUHLHAUSER CO., Cincinnati brewery, has been acquired by a syndicate headed by J. W. Harris, Cleveland, president of Forest City Brewing Co., of that city. The plant will be remodeled to give it an annual capacity of 500,000 bbl. of beer.

PERSONNEL

J. BECKER, Becker Pretzel Co., has been elected president of the National Pretzel Manufacturers' Association. Other officers include W. Noss, Noss Pretzel Co., Cleveland, vice-president; J. H. Walborn, Purity Pretzel Co., treasurer; and Mark Holtman, secretary.

H. T. BINGHAM, head of the citroculture department of Edinburgh Junior College, is president of the newly formed Texas Citrus League. This organization will function to secure legislation beneficial to the citrus industry in the Lower Rio Grande Valley. Lon T. Hall, Harlingen, has been chosen vice-president, and W. R. Gwathmey, Dona, secretary-treasurer.

K. L. BURNS, president of Globe Milling Co., Watertown, Wis., was chosen president of Rye Millers' Association of America at its annual meeting in Watertown July 14. Howard W. Files, Pillsbury Flour Mills Co., Minneapolis, was elected vice-president; George W. Haynes, Eagle Roller Mill Co., New Ulm, Minn., secretary-treasurer.

T. C. HAYES
Heads New Tomato Products Group

RAY F. CASTLE, Victoria, B. C., has gone to London where he will attempt to arrange for the marketing of frozen salmon steaks. In Great Britain only river salmon is available, and it is costly.

ROBERT C. FLETCHER, JR., is president of Booth Fisheries Corp., recently formed by reorganization of Booth Fisheries Co. Other officers include Ivor Wagner, vice-

president and treasurer; J. H. Keilty, secretary; F. R. Matlach, assistant secretary; and J. C. Nicholas, assistant treasurer.

W. H. GAUSSELIN, Mutual Sausage Co., Chicago, has been elected chairman of the sausage division of the Institute of American Meat Packers. This division of the institute is working on plans to extend its membership to every manufacturer in the United States. It is planning a series of meetings in various sections of the country for organization and code proposals.

T. C. HAYES, president of American Packing Corp., Evansville, Ind., heads up the newly formed Catsup and Tomato Juice Packers Association. Ralph Kemp, Kemp Bros., Frankfort, is secretary-treasurer. This association is preparing a code which will soon be submitted to the administration.

W. F. HEIDE, Henry Heide, Inc., New York; J. M. Gleason, W. F. Schrafft & Sons Corp., Boston; V. L. Price, National Candy Co., St. Louis; C. H. Woodward, Woodward Co., Council Bluffs, Iowa; and W. M. Hardie, William M. Hardie Co., Cleveland, have been appointed to the National Confectioners' Association industrial board.

OLIN M. JACOBS
Will Direct Confectioners' Association

OLIN M. JACOBS, for the past eight years secretary of New England Manufacturing Confectioners' Association, has been chosen managing director of the National Confectioners' Association. Max F. Burger, Chicago, former special agent for the U.S. Department of Justice, is the new assistant director.

DOUGLAS M. KILPATRICK has been appointed general manager of Standard Sugars, Inc., Thibodeaux, La. Mr. Kilpatrick succeeds the late J. Van H. Beary.

H. ALBERT LACKMAN, president of the newly incorporated Lackman Brewery, Cincinnati, has resigned to go with the W. T. Wagners Sons, mineral water firm. Lackman was an assistant brewmaster of the old Lackman brewery before prohibition.

J. J. LAVIN, president of Rocky Mountain Elevator Co., a subsidiary of General Mills, Inc., has resigned to become Pacific Coast representative of the Chinese government in the purchase of wheat and flour. The Chinese agency is reported to be purchasing $15,000,000 worth of wheat as grain or flour through the Reconstruction Finance Corp.

H. A. CLEMMER HANFORD MAIN K. D. LOOSE
Three Newly Elected Officers of Loose-Wiles Biscuit Co.

HANFORD MAIN, vice-president of Loose-Wiles Biscuit Co., Long Island City, has been appointed executive vice-president and assistant treasurer. He will also serve as a director. K. D. Loose, for 12 years manager of the general manufacturing department, has been placed in charge of production with the title of vice-president. H. A. Clemmer has been made manager of the New York bakery and will serve as assistant secretary and assistant treasurer of the general organization.

I. L. MILLER, former Indiana State Food and Drug Commissioner, has established I. L. Miller & Associates, a consulting service to food industries, with headquarters in the Consolidated Building, Indianapolis.

H. L. PORIGO, president of Victor Flour Mills, Pittsford, N. Y., was elected president of the New York State Millers' Association at the semi-annual meeting in Buffalo, July 18. Other officers elected were H. L. Ward, William Hamilton & Son, Caledonia, vice-president; M. L. Waldorf, Acme Milling Co., Olean, treasurer.

J. A. ROENSTRATOR, Libby, McNeill & Libby, has been appointed a member of a National Meat Canners' Association committee to formulate a code for the meat canning industry, along with L. L. Bronson, Armour & Co.; F. C. McDowell, Foell Packing Co.; and A. R. Watkins, United Packers, Inc.

JAMES V. SLADE, formerly of Dorr Co., New York, will act as technical assistant to U. C. Young, chief production manager for General Foods, New York. He will work on the improvement of processing methods in the Eastern plants.

W. J. SMITH, of La Choy Products Co., Detroit, has been elected president of the newly organized chop suey manufacturers. M. Edgen, of Minsen Trading Co., is secretary. The group is now drawing up a code for the chop suey industry.

DEATHS

URBAN P. ADAMS, metropolitan district manager for Armour & Co., with offices at New York, died July 15 of pneumonia. Mr. Adams was almost 56.

GEORGE C. BIDGOOD, who was elected treasurer of American Bottlers of Carbonated Beverages when it organized in 1920 and who was vice-president of the national association during 1921 and 1922, died July 1. Mr. Bidgood, who was 65, was president of Eastern Supply Corp.

WILLIAM CALVERT, president of San Juan Fishing & Packing Co., Seattle, Wash., and one of the pioneers of the Northwest halibut trade, died June 29 at the age of 65.

CHARLES G. KRIEL, president of C. G. Kriel Co., died in Baltimore, July 11, of heart disease. Mr. Kriel became connected with the packing company early in his youth.

MAX M. LOWENSTEIN, president of Norris, Inc., Atlanta, Ga., and president of Monarch Mfg. Co., Atlanta, died July 10. He was 48.

Associated Industries

GENERAL AMERICAN TRANSPORTATION CORP., Chicago and New York, has taken over the refrigerator car operations of the Missouri, Kansas & Texas Railroad, increasing its operating mileage from 28,496 to 31,684. The company has also acquired the large liquid storage terminal of the American Mineral Spirits Co. at Carteret, N. J.

MACHINERY & ALLIED PRODUCTS INSTITUTE has been formed to serve as a coordinated agency among groups of machinery builders and producers of machine supplies and other types of capital goods. The new body will take the form of a federation and the membership will be open to trade associations only.

TOLEDO SCALES CO. has established a service department equipped to repair any type of weighing instrument. All makes of scales will be serviced.

BUSINESS TRENDS

Exports in First Quarter Higher Than in 1932

Although American exports are substantially below the average for the last five years, exports of most products for the first quarter of 1933 are considerably larger in volume than for the same period last year. Lard exports, totaling 183,542,000 lb., were 8 per cent larger than last year, while oil cakes and oil-cake meal exports were 2 per cent larger. Even though 19 per cent more cured hams and shoulders, 14,039,000 lb. in all, were shipped abroad than in 1932, these products were only 60 per cent of the five-year average. Like wheat exports, the amount of wheat flour was far below the normal volume shipped abroad, being 55 per cent below 1932 and 67 per cent below the five-year average.

Coffee, the chief import of the country, was 13 per cent of the total import volume, the largest proportion in post-war years. However, the amount was 14 per cent below 1932 and 10 per cent below the five-year average. The one and a third billion pounds of cane sugar imported was 75 per cent of the quantity imported in 1932 and 68 per cent of the five-year average.

The declines below the first quarter of 1932 and the 1928-32 average, respectively, were bananas, 17 and 30 per cent; fish, 12 and 11 per cent.

Food Prices Rise

Threatened shortage due to continued dry hot weather, aided by the speculative rise in all commodities, has brought food prices up sharply during July. Last week's break in the speculative market is too recent to be reflected in the activity index of business and was not sufficient to wipe out the previous gains.

Average wholesale prices of all commodities reported by U. S. Department of Labor rose 6.82 per cent during the month ending July 15. Farm products advanced 15.72 per cent, indicating a high speculative interest. Foods responded to give an 8.03-per cent rise.

Immediate effects of the market break are reflected in the weighted index of prices of the *Journal of Commerce*, New York. Grains had a net gain of only 3.23 per cent for the month ending July 22. All commodities had a net gain of 7.53 per cent and food 11.75 per cent.

The Business Week Index of business activity shows a new 1933 high of 69.1 per cent of normal for the week ending July 15.

A. & P. tonage sales for the month of June were 4.47 per cent less than for June, 1932, but nearly 28 per cent greater than for May, 1933.

Official Crop Report Shows Decided Drop in Yields

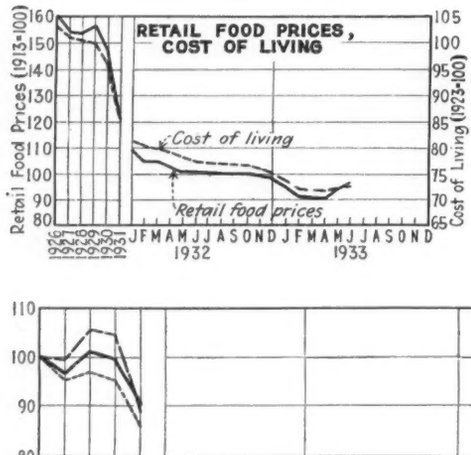
Raw materials for processors and manufacturers of cereals, as well as foodstuffs for livestock supplied to the meat packing industry, will be considerably less this year than last. Winter wheat, based on conditions as of July 1, is estimated by the government to yield 335,767,000 bu., 254,000,000 bu. less than the five-year average. Production of spring wheat, other than durum, is placed at 142,000,000 bu., as against 206,000,000 bu. for the five-year average. Durum wheat will yield 18,000,000 bu., compared with the 66,000,000-bu. five-year average.

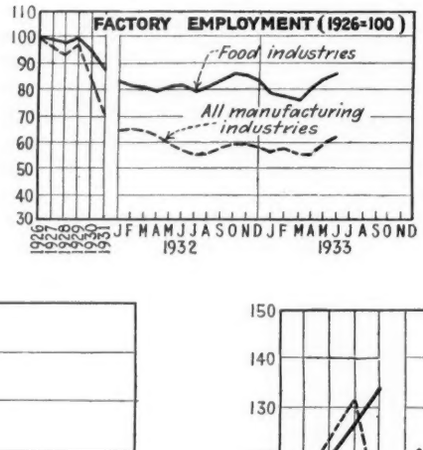
Less feed will be available for fattening hogs for market, since this year's corn crop is predicted to be 2,384,000,000 bu., compared with the five-year average of 2,512,000,000 bu. However, the government reports a 3 per cent increase in the pig crop of this spring, and there is a prospective increase of 8 per cent in the number of sows to farrow this fall.

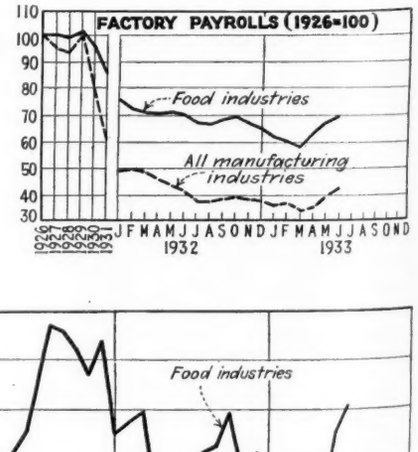
The forecast for rye indicates the lowest crop in 40 years, or 25,300,000

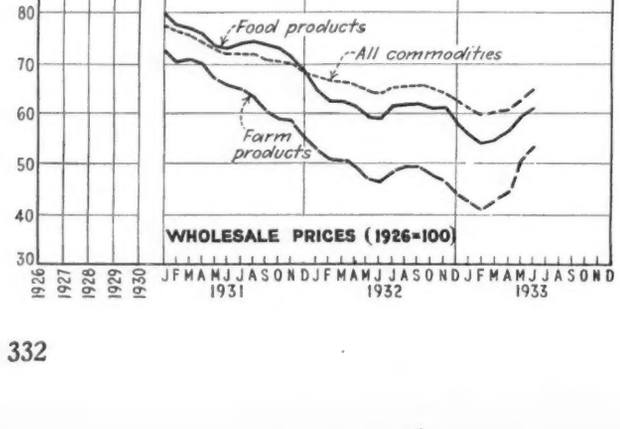
BASIS FOR THE CURVES

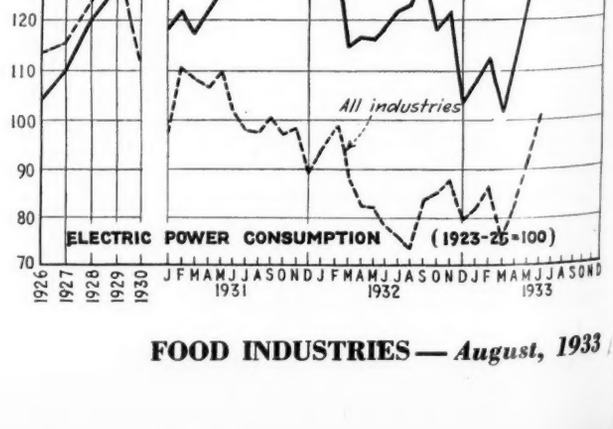
Retail food prices, factory employment, factory payrolls and wholesale prices are based on indexes of the Department of Labor. Cost-of-living index is that of the National Industrial Conference Board. Electrical power consumption figures are furnished by *Electrical World*.











bu., as compared with the 41,600,000 bu. five-year average. This is barely sufficient for normal requirements. Barley also has taken a tremendous drop. The estimated yield is 170,000,000 bu.; the five-year average, 264,000,000 bu. Rice millers will have a potential supply of 33,900,000 bu., as against the five-year average of 43,000,000 bu.

Hops for brewers will total 32,600,000 lb., an increase over the five-year average of 30,740,000 lb., but there is anxiety over a prospective world-wide shortage on account of the large demand in America.

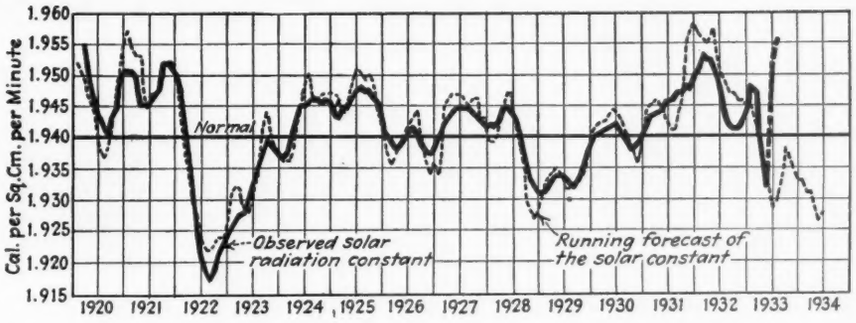
Other crop yields estimated for this year are: beans, dry edible, 10,200,000 bags (100 lb.); apples, 150,000,000 bu.; peaches, 45,100,000 bu.; pears, 21,800,000 bu.; grapes, 1,300,000 tons; potatoes, 306,000,000 bu.; sweet potatoes, 61,200,000 bu.; sugar beets, 9,680,000 tons. With the exception of sugar beets, these are all below the five-year average.

Even though the wheat crop will be exceptionally small, Secretary Wallace will apply crop curtailment as originally planned, believing that a carryover of 350,000,000 bu., chances of a normal crop next year, and a heavy world crop make this advisable.

Milk Up in Several States

Advances in the price of milk have been reflected in several states during the past several weeks, and in most cases there has been at least a one-cent difference between the price of milk delivered and "over-the-counter" in quart containers.

In New York City the prices are 12 and 11 cents for Grade B, respectively, while up-state they are 11 and 10. There have also been general increases in the price of raw milk, the greatest being in Louisiana and south Mississippi, where minimum prices for quarts are 12 cents delivered and 11 cents at stores. Old prices were 5 to 8 cents a quart. The new price will bring dairymen about $1.82 per 100 lb. at receiving stations instead of the previous $1. Milk in Indianapolis is selling at 6 cents a pint and 9 cents a quart. Base milk testing 3.5 per cent butter fat at St. Louis is being sold for $1.35.



Solar Radiation Still High

The solar constant of radiation is still unexpectedly high. On account of a change of observers at the Table Mountain Observatory on May 1, occurring simultaneously with the abrupt change of solar constant values, the recorded figures are to be regarded as tentative only until many months have elapsed and an opportunity has been afforded to check concurrent readings with those of other observers who at present are abroad.

For that reason, the observed values are shown as a heavy dotted line until the check-up has been effected.

Recent monthly means have been reported by the Smithsonian Institution as follows:

March, 1933	1.940	May, 1933	1.952
April, 1933	1.932	June, 1933	1.951

INDICATORS

WAGES continue to rise in the food industries. Schulze Baking Co., Omaha, has increased wages 25 per cent; Curtiss Candy Co., Chicago, plans an increase in wages and in salaries of office employees; Sperry Flour Co., San Francisco, has canceled a 10-per cent wage cut; McCormick & Co., Baltimore, announces a 25 per cent wage increase for 150 employees; Emmart Packing Co., Louisville, 10 per cent for all employees; Louisville Provision Co., Louisville, 5 per cent.

CONSUMPTION of legal beer for 1933 is estimated at 40,000,000 bbl. by United States Brewers' Association. The association is boosting 5-cent beer.

CUBA'S 1933 sugar crop is 23 per cent below that for last year, amounting to 1,994,663 long tons, the lowest in 20 years. In 1929, Cuba harvested a record crop of 5,156,315 tons. This was 18 per cent of world total, as against this year's figure of 8 per cent.

"SALMON INDUSTRY FINE," is the word from Alaska. "Bristol Bay area filled up in 14 days. The pack of red salmon is larger than last year. Alaska packers should do well on $1.65 reds. Too early for pinks to show up. Figure about 2,500,000 cases in Alaska and 750,000 cases on Puget Sound. Salmon prices holding at much better levels than last year."

JAPAN will produce between 400,000 and 450,000 cases of canned tuna in 1933, it has been estimated in the trade at Tokio.

PINEAPPLE Producers' Cooperative Association announces that the pack of pineapples for the year ending June 1 has been set at 8,000,000 cases; last year it was 9,250,000 cases. Most of last year's pack and carryover has passed into distribution.

MORE SNAP BEANS will be available for canning this year. The acreage is 3½ per cent larger than in 1932, amounting to 32,800 acres, according to a preliminary estimate by the Bureau of Agricultural Economics.

CONSUMPTION of condensed and evaporated milk is decidedly on the increase in the Rocky Mountain region, according to Paul W. Hinds, sales manager of that section for Borden Co.

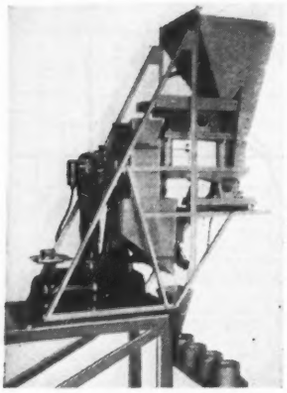
ACREAGE of Colorado's sugar beet crop has been increased 23 per cent to 218,000 acres this year. The condition of sugar beets on July 1 was 84 per cent, as compared to 71 per cent for last year.

BREAD SALES have increased for 19 consecutive weeks at the Detroit branch of General Baking Co. . . . The larger bakers in Detroit seek a 20-oz. loaf, presumably to sell at 10 cents.

CONSTRUCTION NEWS

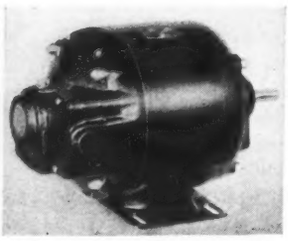
	Proposed Construction Pending	Contracts Awarded — Awarded July	Cumulative 1933 — No. Awards	Cumulative 1933 — Total
Bakery Products	.....	$106,000	18	$420,000
Beverage	$7,576,000	1,941,000	48	4,523,000
Canning and Preserving	663,000	50,000	6	193,000
Confectionery	.....	.....	....	.....
Grain Mill Products	1,265,000	270,000	13	909,000
Ice Manufactured	357,000	.....	5	256,000
Meats and Meat Products	.....	.....	6	366,000
Milk Products	232,000	150,000	25	845,000
Sugar	.....	.....	..	.....
Miscellaneous	408,000	299,000	12	627,000
Total	$10,501,000	$2,816,000	133	$8,139,000

NEW • EQUIPMENT • FOR



Precision Packager

As many as 1,000 1-lb. packages may be filled per hour to an accuracy of $\frac{1}{16}$ oz. with the precision weighing nad automatic filling device marketed by Toledo Scale Co., Toledo, Ohio. Furthermore, the machine makes net weighings, checks the predetermined net weight automatically, obviates errors by being electrically interlocked and handles food products without damaging them. The machine employs a Trayco vibrator feeder and a pre-weigh hopper which dumps into a final-weigh hopper, where another vibrator feeder sifts in material to the correct weight.

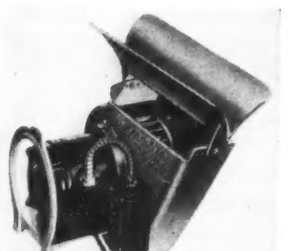


Motor for Pumps

Specially designed for driving small water pumps, a new single-phase fractional horsepower motor developed by General Electric Co., Schenectady, N. Y., is readily adapted to beer pumps and similar equipment. The motor, type RSA, has drip-proof end flanges, a large bearing-oil capacity which makes oilnig unnecessary more than once a year, and a built-in terminal box to simplify installation. It is available in $\frac{1}{6}$-, $\frac{1}{4}$- and $\frac{1}{3}$-hp. ratings.

Magnetic Separator

Equipped with a trapdoor, the spout-type magnetic separator patented by Magnetic Manufacturing Co., Milwaukee, Wis., removes foreign metallic material from grain and cereals and discharges it readily. The trapdoor opens and closes magnetically, the operator merely turning the current on or off. The unit is self-contained and comes ready for plugging into a 110- or 220-volt, a.c. outlet. No generator is required.

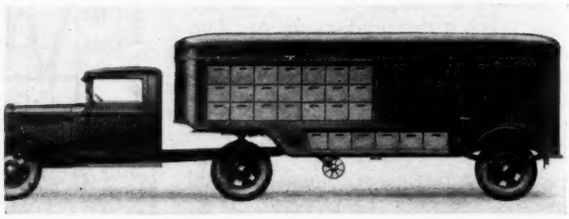


Fan for Coolers

Wet ceilings and mold in walk-in coolers are said to be eliminated and the air to be kept crisp and fresh with the De-Frostaire air-circulating unit announced by Brown Corp., Syracuse, N. Y. The machine also prevents excess frosting of the coils, the manufacturer reports. The unit consists of a motor-driven fan with baffles that deflect the air stream in the proper direction. It is so placed that the air stream passes over the coils and creates a downward flow on the up-draft side of the cooler. This is said to give a balance in air circulation that prevents drying or discoloring of the produce. In operation, the unit starts when the temperature of the coils reaches a certain point, around 30 deg. F., and stops when the temperature falls to a predetermined point between 30-24 deg.

Steel Beer Barrel

Introduced to sell at a price competitive with that of the wooden variety, a steel barrel announced by A. O. Smith Corp., Milwaukee, Wis., is made of medium-high-carbon steel, is of all-welded construction and weighs about 60 lb. in the half-barrel size. It is lined with a coating said to give neither taste, odor nor color to the beer. The half-barrel size is 23 in. high, with a 17$\frac{1}{2}$-in. diameter. It has a collar fabricated around the center, facilitating handling.



Trailer for Beverages

Practically the entire side of the body opens in the semi-trailer developed by Fruehauf Trailer Co., Detroit, Mich., for hauling bottled beverages in cases. Two overhead sliding doors, 96 in. wide, give access to front and rear compartments, each of which holds 84 cases. Space for six more cases is provided on each side in the "skirt" of the trailer. The doors to the small compartments drop into a horizontal position and may be used as steps. All doors are provided with locks. The over-all height of the trailer has been kept to 8 ft. 8 in. The loading platform is 42 in. from the ground.

Three Light Trucks

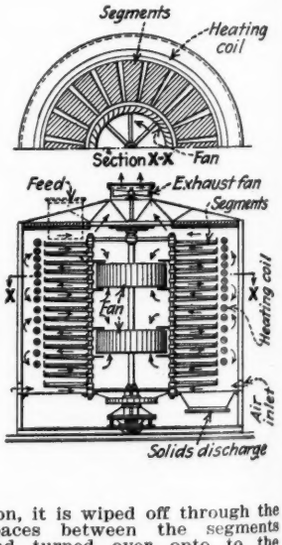
Three new six-cylinder trucks, designated as 15A, 20A and 25A, and rated at 1$\frac{1}{2}$, 2 and 2$\frac{1}{2}$ tons, respectively are announced by Federal Motor Truck Co., Detroit, Mich. The new trucks are designed with a long streamline hood and cowl, wide sweeping fenders and a large chrome-plated slanting V-type radiator. The manufacturer mentions the 8$\frac{1}{2}$-in. maximum depth of the frame as an example of the sturdy construction. The new models are equipped with 6-cyl-inder, 7-bearing engines governed at 2,600 r.p.m. The three motors develop 58, 67 and 72 hp., respectively.

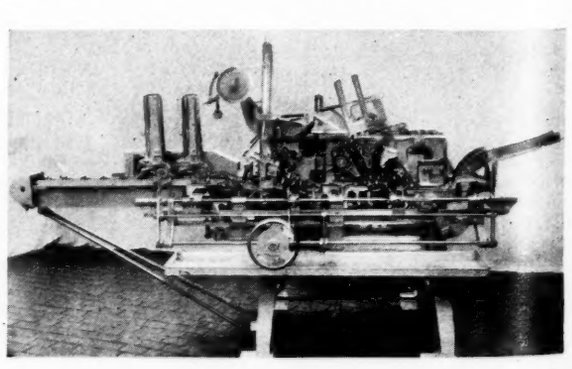
Candy Bar Wrapper

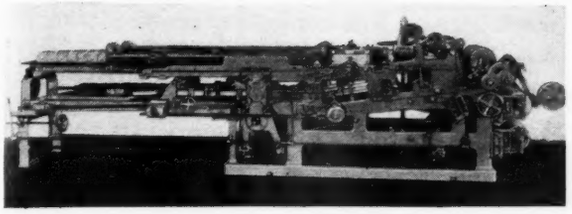
To meet the demand for flexibility in style of wrapping, adjustability in size and high rate of production, Package Machinery Co., Springfield, Mass., developed its model CA-2 bar wrapping machine. The machine will wrap molded bars with square or beveled edges, bars containing almonds or peanuts, bars with rounded ends, thin sticks of chewing gum and other articles. As many as ten pieces at a time can be included in one wrapping, and the machine will handle inserts. The wrapper operates at 80 to 150 packages per minute. It has the following size limits: maximum, 5$\frac{1}{2}$x2$\frac{1}{2}$x$\frac{3}{4}$ in.; minimum, 1$\frac{1}{2}$x$\frac{5}{8}$x$\frac{1}{16}$ in. Two operators are required, one to feed and one to pack.

Vertical Turbo Dryer

Built upon new principles, the vertical turbo dryer developed by the Buettner Works, Uerdingen, Germany, dries and handles food products, it is said, efficiently and in a gentle manner that will cause neither injury to the product nor loss of taste, aroma or color. Briefly, the unit consists of a series of segmented annular shelves, one below the other, rotating slowly around the turbo fans which circulate the air through the shelves in screw spiral fashion. The heating elements are so spaced around the annular shelf system as to provide graduated drying conditions in order to prevent casehardening of the material. The material is fed through an opening at the top onto the shelves. As the shelves move it is spread into a thin layer, and, after a full revolution, it is wiped off through the spaces between the segments and turned over onto to the shelf below, this operation being repeated after each revolution until the material reaches the bottom. The air enters at the bottom and leaves through an exhaust at the top, practically free from dust. Uniform and rapid drying are other attributes of the unit.





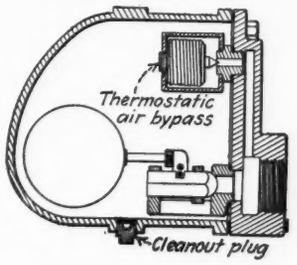


Slices and Wraps

Sixty or more loaves may be sliced and wrapped per minute in the built-in slicing and wrapping machine manufactured by Battle Creek Wrapping Machine Co., Battle Creek, Mich. The machine is equipped with conveyor sealers which intermittently tap the heated wax paper (or self-sealing cellulose) to form a "weld-tight" seal. It will handle printed or plain wax paper, waxed glassine or self-sealing cellulose interchangeably, with either double or single wrap. To facilitate handling the waxed paper, the paper feed roller is water-cooled. The machine will slice and wrap loaves 7 to 17 in. in length, 3 to 7 in. in width and 3 to 5¾ in. in height. Only 5 to 8 minutes is required for changing over from one size to another. "Radio Dial" control enables the speed to be adjusted from 40 to 70 loaves per minute. Of open construction, the machine is lighted inside to make operations visible.

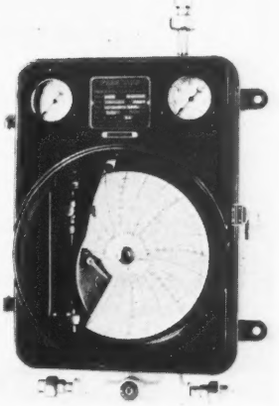
Heavy-Duty Trap

Condensation in large quantities and in sudden rushes, such as occurs in unit heaters and pipe coils, is handled by the thermostatic float trap introduced by Sarco Co., New York, N. Y. The trap has a 1¼-in. inlet and outlet. It is built for pressures up to 10 lb., but can be furnished for pressures as high as 60 lb. The thermostatic valve prevents air binding.



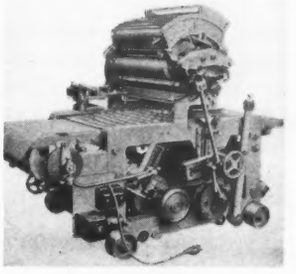
Time Controllers

Pressure or temperature control according to a predetermined rate of change may be accomplished by means of the time-temperature and time-pressure controllers manufactured by Bristol Co., Waterbury, Conn. The time-pressure controller shown in the illustration has a large cam driven by a clock. The cam is a graduated chart on sheet aluminum that can be cut to comply with desired control characteristics. The time-temperature controller differs from the pressure controller in that it has an indicating pointer showing the instantaneous pressure or temperature. The controllers will regulate a temperature from 40 to 1,000 deg. F. and a pressure from 10 to 2,000 lb., and either maintain or reduce it at a given rate.



Confection Depositor

Designed for depositing either confectionery or bakery sweet goods, the OKA depositor, marketed by Baker Perkins Co., Inc., Saginaw, Mich., operates on a new principle copied from the old hand-bag method of depositing. The extrusion mechanism consists of a stationary and a swinging roll operating together, a swinging hopper and an extrusion chamber. The extrusion rolls treat the plastic mass gently, and delicate materials, such as marshmallow, fondant, doughs containing a large quantity of butter, and foamy beaten materials, can be handled without damage, according to the manufacturer. The variety of shapes and sizes produced is almost unlimited. Short doughs and confectionery pieces can be embossed; S shapes, triangular pieces, fancy wave pieces and other items can be formed. A wire cut and table-drop-motion scheme insure a wide range of application on many materials. The output of the machine averages about 70 strokes per minute.

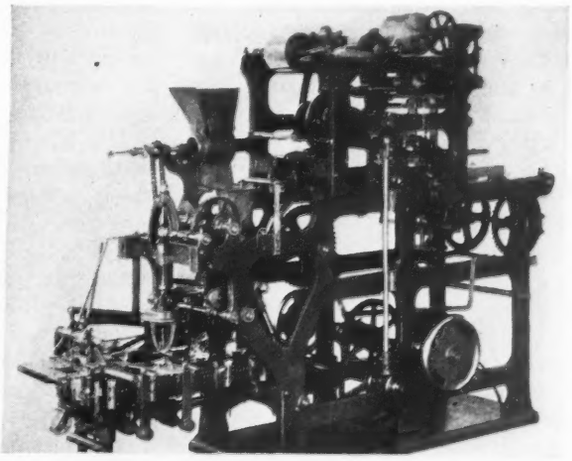


Photoelectric Relay

Designed for simple applications in which the operating light beam is completely intercepted by an object that is practically opaque, the CR7505-K1 photoelectric relay announced by General Electric Co., Schenectady, N. Y., is well adapted to the operation of magnetic counters. The count should not exceed 400 per mniute. A minimum illumination of 5 foot-candles is required, although with a special cover the relay will pick up on a minimum illumination of 1 foot-candle. The device will operate from light flashes or interruptions of not less than 1/15-second duration with not less than 1/15 second between impulses. The relay operates from 110-volt, 50 or 60-cycle, a.c. supply.

Forms, Fills, Seals

Starting with transparent cellulose in roll form, a machine manufactured by Peters Machinery Co., 4700 Ravenswood Ave., Chicago, Ill., forms the material into a bag, seals the sides with adhesive and heat, fills the bag, twists it and seals the neck of the twist with colored tape. When equipped with an electric eye, the machine will handle printed transparent cellulose. The unit will deliver 9,000 or more finished packages per day. It will handle a large variety of sizes, the largest of which is 3½x5 in. at the bottom and 8 in. high; the smallest, 3 in. by 1¾ in. at the bottom and 8 to 10 in. high. The seal formed by the machine is airtight and moisture-proof, the manufacturer states.



The Manufacturers ••Offer••

Chemicals—Divers chemicals are discussed in "A Chemical Almanack," by Merck & Co., Inc., Rahway, N. J., which includes 32 pages of fact and photograph.

Cork—The 13-page booklet by Mundet Cork Corp., 450 Seventh Ave., New York, N. Y., lists prices for all "Jointite" cork pipe covering.

Turbines — The application and construction of condensing bleeder turbines are described in a 12-page illustrated booklet by Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.

Food Companies—A review of the annual reports of more than 25 food and beverage companies for the years 1929-32 is contained in a booklet, "Annual Report of Stockholders of Food and Beverage Companies," by Metropolitan Life Insurance Co., 1 Madison Ave., New York, N. Y.

Chocolate—Solidification curves for chocolate and their meaning to chocolate and candy manufacturers are the subjects of a 6-page leaflet by American Lecithin Corp., 11 West 42d St., New York, N. Y. Apparatus for determining and observing operating temperatures is described.

Corn Products — King Corn and his family are the characters in the 32-page booklet, "The Story of a Grain of Corn," by Associated Corn Products Manufacturers, 208 South La Salle St., Chicago, Ill.

Pectin—Citrus pectin and its uses are treated in a 27-page illustrated booklet by California Fruit Growers' Exchange, 99 Hudson St., New York, N. Y. Certain basic formulas and recipes are furnished for confectioners.

Sugar—Complete details as to the manufacture of sugar are given in a 24-page souvenir Century of Progress booklet by National Sugar Refining Co., 129 Front St., New York, N. Y.

Rye bread—Formulas and details for the manufacture of rye bread are published in Bulletin No. 86 by American Society of Bakery Engineers, 1541 Birchwood Ave., Chicago, Ill.

Malt Machinery — Standard malt cleaners and malt mills are described with the aid of cuts in a leaflet, No. 2161, by Allis-Chalmers Manufacturing Co., Milwaukee, Wis.

Ice Machine—An 8-page bulletin, No. 47, by Vilter Manufacturing Co., Milwaukee, Wis., describes the company's rotary-type refrigerating machine, which functions either as an air-cooled or water-cooled unit.

Presses—Set-ups for the various materials on which expeller presses are used are listed in a 28-page illustrated booklet by V. D. Anderson Co., Cleveland, Ohio.

Packaging—Detailed descriptions of various wrapping machines constitute the 61-page catalog by Package Machinery Co., Springfield, Mass. There are many illustrations.

Coolers — The suspended and floor type unit coolers manufactured by Buffalo Forge Co., Buffalo, N. Y., are illustrated and described, with specifications, in a folder leaflet by the company.

Confectionery — Recipes of candies originating in seventeen different countries are modified to conform to American methods and tastes in the 62-page booklet by Nulomoline Co., 111 Wall St., New York, N. Y.

The Proof of Good Coffee Is in the Drinking

(Concluded from page 293)

a nine-cup drip pot using a paper filter, a nine-cup drip pot using no filter other than the finely perforated bottom of the coffee basket and a seven-cup electrically heated percolator of the valve type. (A valveless percolator was not included, as in this variety all of the water has to be heated to boiling before pumping begins.) In all of the tests the same proportions of coffee and water were used, while the clarity and beverage strength were determined by the methods to be described later. In the drip pots the extraction time naturally was determined by the quantity of water used. In the percolator the pumping time was shortened in each case to that necessary to give a beverage temperature of 190-200 deg. F. This time was found to be about 5 minutes when three, four or five cups were made.

A detailed description of the 46 tests made would require too much space. The conclusions that were drawn from the results obtained support the theory, however, and are as follows:

1. There was no increase in cloudiness when the finer grind was used; the clarity was equally satisfactory in the case of the two pots without special filters.

2. In the case of the drip pots the use of the finer grind did not increase the time of operation.

3. In the drip pots, the use of the finer grind gave a beverage 40 to 75 per cent stronger in flavor when three to five cups were made in nine-cup pots.

4. In the percolator, the finer grind permitted a shorter extraction time, resulting in a better flavor quality and at the same time 45 to 65 per cent greater strength.

Briefly, then, a finer "universal" grind offers the consumer:

1. Better extraction efficiency.

2. Time saving and flavor improvement in the percolator.

3. No increased turbidity.

All of these advantages are among those mentioned as likely to increase consumer satisfaction.

Knowing—Not Guessing—What Types Of Candy to Pack

(Concluded from page 303)

incorporated, when sufficiently favored by the jury, in the new Chateau line.

It was found that replies came in most speedily when no material lapse in mailings occurred from the factory; but care was taken not to overlap test-box mailings by giving insufficient time for test samples to be consumed before sending out another assortment.

Early in the survey the company found that after ten days about 55 per cent of the return cards would have arrived; after 20 days, 80 per cent; and after 25 days, all that could be expected. This tended to speed up as the survey progressed, until later on, ten days would bring 70 per cent of the return cards; fifteen days, 80 per cent; and 25 days, 100 per cent. It was found important to mail test boxes regularly rather than wait for a 100 per cent return of cards. This tended to hold the interest of the group and resulted in a much speedier return of the replies.

In analyzing the returns 10,546 opinions were secured. These were carefully obtained and the letters sent out gave advice as to proper intervals between sampling test pieces to avoid taste overlaps, besides emphasizing the necessity of recording individual and not family opinion. The group verdict favored twelve varieties per box, regardless of the size, and this has been adopted in the Chateau units, which are sold in three assortments, making nine package choices in all.

W. F. De Maris, sales research manager of the New England company, states that the consumers' research group method has been adopted by this organization as a standard procedure. It is being applied to the analysis of other candies' popularity, the jury list being maintained with a turnover of about 3 per cent. The sales of the Chateau brand paid for the research within six months and dealer acceptance has been highly satisfactory. The only advertising done thus far has been in the form of a colored pasteboard window and counter bracket set-up for box display as shown in illustration (p. 303). The method of taste analysis described probably will be extended to other sections of the country in the near future.

Putting Consumer Satisfaction Into Flaked Cereals

(Concluded from page 302)

the rolls to a dryer and from the dryer to the toaster.

In wheat and rice flake manufacture agitators usually feed the cereals from the hopper through a perforated bottom to the rolls because a corrugated feeder will "mush" the rice or wheat. Both of these grains are softer than tempered corn grits, and double or larger flakes will result. They detract from the appearance of the finished product.

Rice can be blistered in the same manner as corn. Because of its bran coating, cooked wheat does not blister well and usually makes a curled smooth flake. Rice or corn will not only make better blisters but will also furnish a more uniform flake if a tempering steam conveyor is used to convey them to the hopper over the rolls. This added steam compensates for variation in the moisture content of the grain going to the rolls.

Codes Help, Beer Harms

Dairy manufacturers in general are of the opinion that codes of fair competition will greatly help the dairy industry, according to the opinion of a prominent manufacturer of dairy equipment. Manufacturers who have been operating under the low prices of the past few months now find that their red figures have turned to black with the price rises in various localities. In general, however, wage increases have not yet gone into effect.

The same observer finds that the return of beer has done considerable damage to the dairy industry. However, he continues, dairy manufacturers, especially ice cream makers, are successfully seeking new markets for their products. Ice cream manufacturers who have concentrated their efforts on selling large volumes of bulk ice cream at low prices have been sliding backward, for the demand for packaged ice cream has risen in some sections from 20 to 45 per cent of the total sales volume. Indications are that this trend will mount until bulk ice cream will pass out of the picture. Such a trend naturally calls for many adjustments within the industry.